

INSTALLATION MANUAL

R-410A XX SERIES

6 - 10 Ton

60 Hertz



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General

XX units are single package heat pumps designed for outdoor installation on a rooftop or slab and for non-residential use.

These units are completely assembled on rigid, permanently attached base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require electric power and duct connections.

Safety Considerations



This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention the signal words **DANGER**, **WARNING** or **CAUTION**.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury**.

WARNING indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury**.

CAUTION indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance or for additional information, consult a qualified contractor, installer or service agency.

CAUTION

This product must be installed in strict compliance with the installation instructions and any applicable local, state and national codes including, but not limited to building, electrical, and mechanical codes.

WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer or service agency.

CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system. Gauge sets, hoses, refrigerant containers and recovery systems must be designed to handle R-410A. If you are unsure, consult the equipment manufacturer. Failure to use R-410A compatible servicing equipment may result in property damage or injury.

WARNING

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

Due to system pressure, moving parts, and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, trained service personnel should install, repair, or service this equipment. Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters.

Observe all precautions in the literature, labels, and tags accompanying the equipment whenever working on air conditioning equipment. Be sure to follow all other applicable safety precautions and codes that apply.

Wear safety glasses and work gloves. Use quenching cloth and have a fire extinguisher available during brazing operations.

Inspection

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing.

Reference

Additional information is available in the following reference forms:

- Technical Guide - XXA7, XX08-09, XX12
- General Installation - XXA7, XX08-09, XX12 5261049

- Economizer Option or Accessory -
Vertical Flow Dry Bulb Economizer Factory installed
Option or Field Installed accessory
Horizontal Flow Dry Bulb Economizer Field Installed
accessory
- Power Exhaust Accessory -
Vertical or Horizontal Flow Field Installed

Renewal Parts

Contact your local Ducted Systems parts distribution center for authorized replacement parts.

Approvals

Design certified by CSA as follows:

1. For use as a heat pump unit.
2. For outdoor installation only.
3. For installation on combustible material.

CAUTION

This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including, but not limited to, building, electrical, and mechanical codes.

WARNING

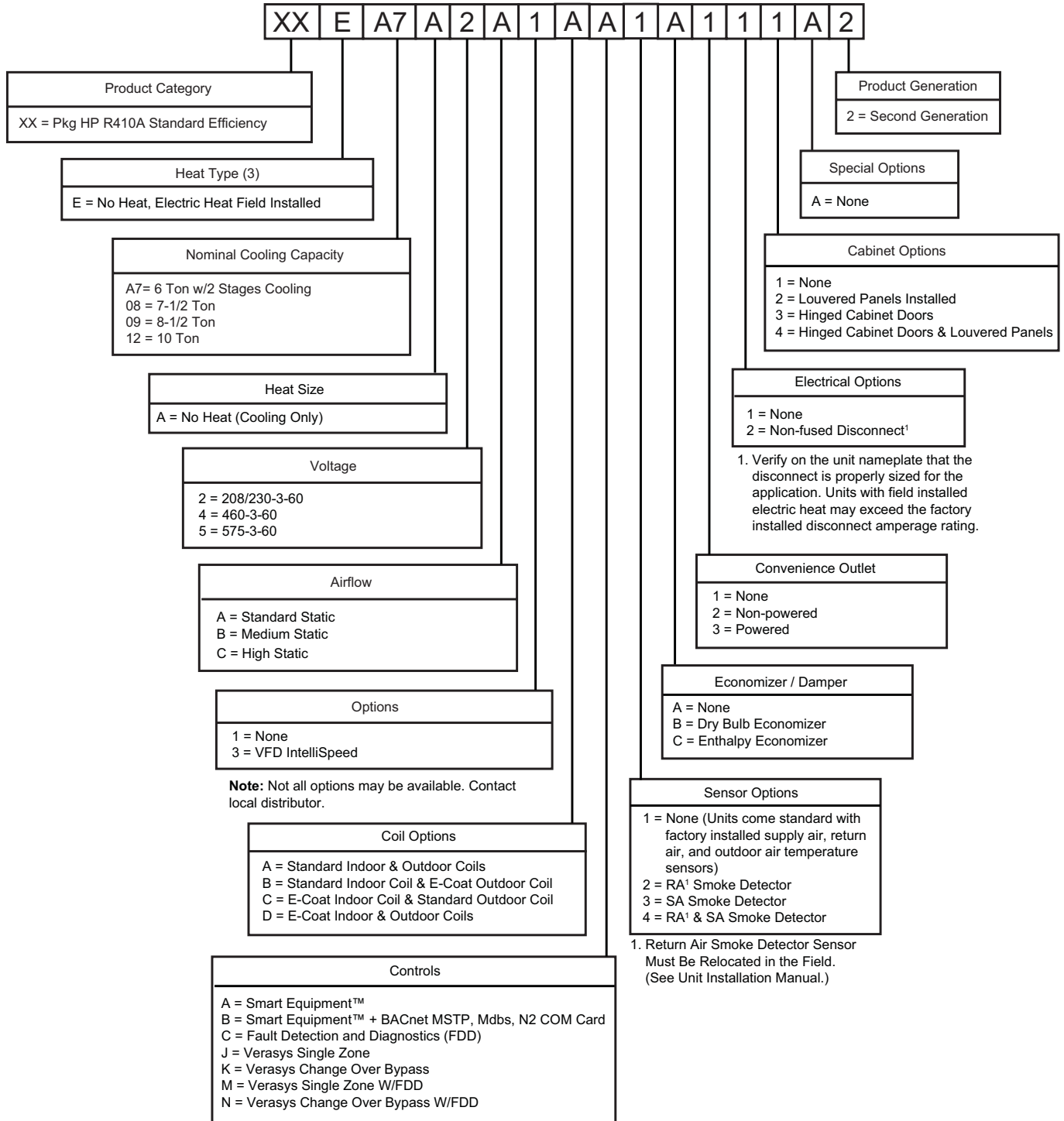
Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

Nomenclature

6-10 Ton Model Number Nomenclature



Installation

Installation Safety Information

Read these instructions before continuing this appliance installation. This is an outdoor combination heating and cooling unit. The installer must assure that these instructions are made available to the consumer and with instructions to retain them for future reference.

1. Install this unit only in a location and position as specified on Page 7 of these instructions.
2. This equipment is not to be used for temporary heating of buildings or structures under construction.

Preceding Installation

1. Remove the two screws that hold the brackets in the fork-lift slots on the side of the unit.

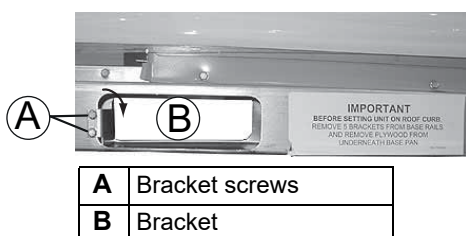


Figure 1: Unit shipping bracket

2. Turn each bracket toward the ground. The protective plywood covering drops to the ground.
3. Remove the protective covering from the condenser coil prior to operation.



Figure 2: Protective condenser covering

4. If a factory option convenience outlet is installed, you must install the weatherproof outlet cover in the field. The cover is located behind the filter access panel.
 - a. Remove the shipping label that covers the convenience outlet.
 - b. Follow the instructions on the back of the cover box.

- c. Attach the cover to the unit with the four screws provided.

CAUTION

208/230-3-60 and units with factory installed Powered Convenience Outlet Option are wired for 230v power supply. Change tap on transformer for 208-3-60 operation. See unit wiring diagram.

5. For gas heating models, you must move the supply air temperature (SAT) sensor to the working position to ensure proper SAT readings. The SAT sensor is shipped in the supply air compartment.
 - a. Move the SAT sensor to the inside of the supply air duct. See item A in Figure 5.
 - b. Use the excess wire available to its full length to drop or mount the SAT sensor in the duct.
 - c. Use the shipping bracket to hold the SAT sensor in the supply air stream. See Figure 3 for the factory SAT sensor location and Figure 5 for the sensor relocation.

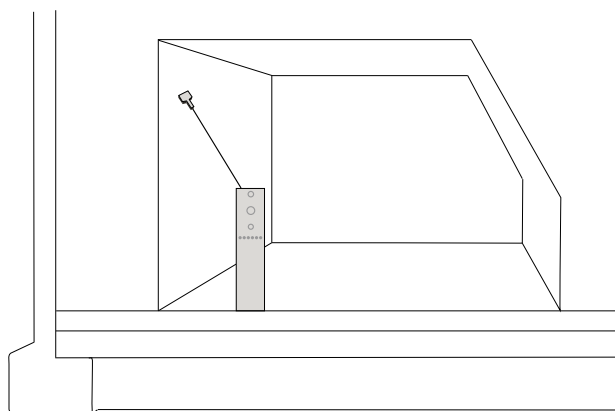
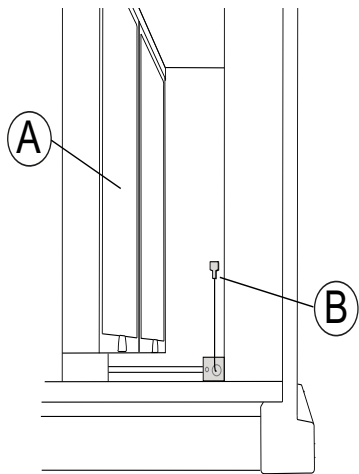


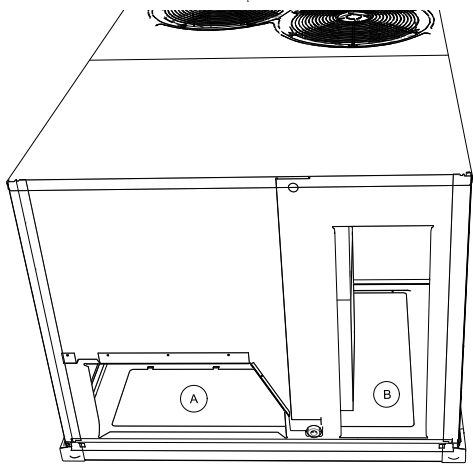
Figure 3: Supply air temperature sensor

6. For units equipped with an economizer or motorized OD air damper, you must move the return air temperature (RAT) sensor to the working position to ensure proper RAT readings. See item B in Figure 5.
 - a. Move the RAT sensor to the inside of the return air duct verifying that the sensor is at least 6 in. below the unit duct opening. The sensor must read the return air temperature not mixed return air and outdoor air temperatures.
 - b. Use the excess wire available to its full length to drop or mount the RAT sensor in the duct.
 - c. You can use the shipping bracket to hold the RAT sensor in the return air stream. See Figure 4 for the factory RAT sensor location and Figure 5 for the sensor relocation.



A	Filter rack and filters	B	RAT sensor
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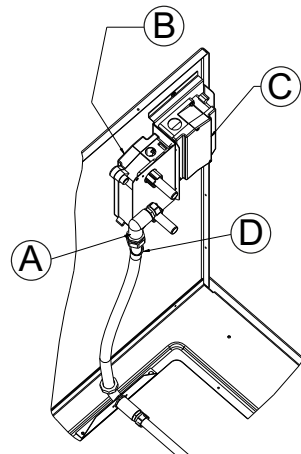
Figure 4: Factory-mounted return air temperature sensor



A	Supply air duct	B	Return air duct
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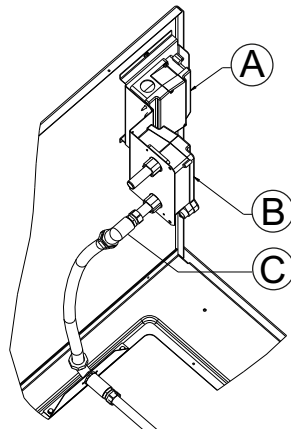
Figure 5: Supply and return air ducts

7. If an optional return air smoke detector is installed, you must move the return air sensor from the factory shipped position (upside down) to the working position (right side up). Then slide the flex tube over the stub and tighten, see Figure 7.



A	Flex tube secured to the bracket	C	Controller
B	Return air sensor	D	Wire tie

Figure 6: Return air smoke detector - shipped position



A	Controller	C	Flex tube in the working position
B	Return air sensor		

Figure 7: Return air smoke detector - working position

Limitations

These units must be installed in accordance with the following:

In U.S.A.:

- 1. National Electrical Code, ANSI/NFPA No. 70 - Latest Edition
- 2. Local building codes, and
- 3. Local utility requirements

In Canada:

- 1. Canadian Electrical Code, CSA C22.1
- 2. Local plumbing and waste water codes, and
- 3. Other applicable local codes.

Refer to unit application data found in this document.

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or customer's expense.

Size of unit for proposed installation should be based on heat loss/heat gain calculation made according to the methods of Air Conditioning Contractors of America (ACCA).

This unit is not to be used for temporary heating of buildings or structures under construction.

Table 1: XXA7, XX08-09, XX12 Unit Limitations

Model	Size (Tons)	Unit Voltage	SCCR (kVA)	Unit Limitations		
				Applied Voltage		Outdoor DB Temp
				Min	Max	Max (°F)
XX	A7 (6)	208/230-3-60	5	187	252	125
		460-3-60	5	432	504	125
		575-3-60	5	540	630	125
XX	08 (7.5)	208/230-3-60	5	187	252	125
		460-3-60	5	432	504	125
		575-3-60	5	540	630	125
XX	09 (8.5)	208/230-3-60	5	187	252	125
		460-3-60	5	432	504	125
		575-3-60	5	540	630	125
XX	12 (10)	208/230-3-60	5	187	252	125
		460-3-60	5	432	504	125
		575-3-60	5	540	630	125

Location

Use the following guidelines to select a suitable location for these units:

- Unit is designed for *outdoor installation only*.
- Condenser coils must have an unlimited supply of air. Where a choice of location is possible, position the unit on either north or east side of building.
- Suitable for mounting on roof curb.
- For ground level installation, use a level concrete slab with a minimum thickness of 4 inches. The length and width should be at least 6 inches greater than the unit base rails. Do not tie slab to the building foundation.
- Roof structures must be able to support the weight of the unit and its options/accessories. Unit must be installed on a solid, level roof curb or appropriate angle iron frame.
- Maintain level tolerance to 1/2" across the entire width and length of unit.

Clearances

All units require particular clearances for proper operation and service. Installer must make provisions for adequate ventilation air. Refer to Table 4 for clearances required for servicing and proper unit operation.

WARNING

Do not permit overhanging structures or shrubs to obstruct condenser air discharge outlet, outdoor coil face or combustion air inlet or vent outlets.

Rigging And Handling

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, **MUST** be used across the top of the unit.

CAUTION

If a unit is to be installed on a roof curb other than a Ducted Systems roof curb, gasketing must be applied to all surfaces that come in contact with the unit underside.

CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.

LENGTH OF FORKS MUST BE A MINIMUM OF 60 INCHES.

CAUTION

All panels must be secured in place when the unit is lifted.
The condenser coils should be protected from rigging cable damage with plywood or other suitable material.

XXA7, XX08-09, XX12 Unit Weights

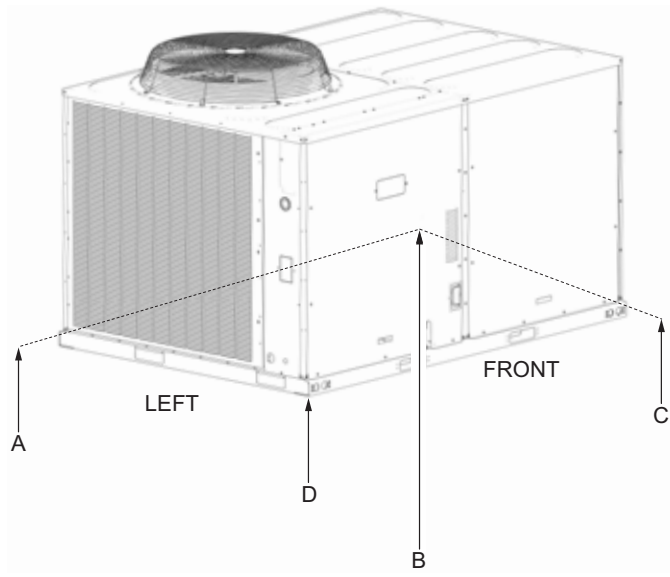


Figure 8: Unit 4 Point Load Weight

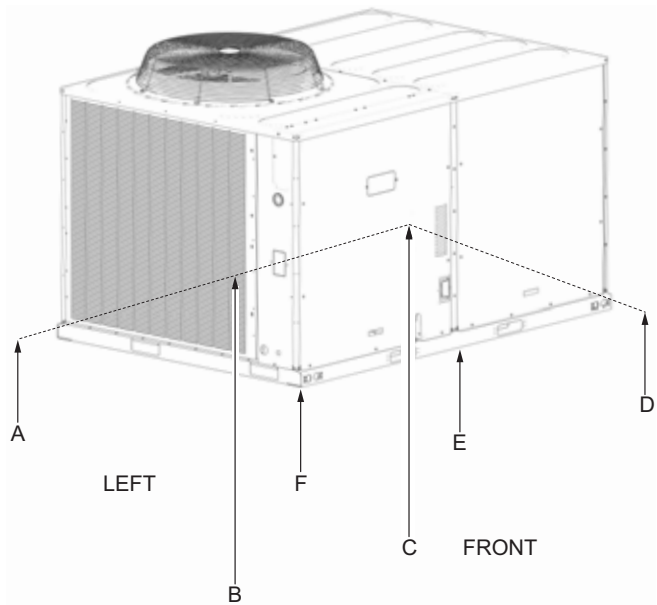


Figure 9: Unit 6 Point Load Weight

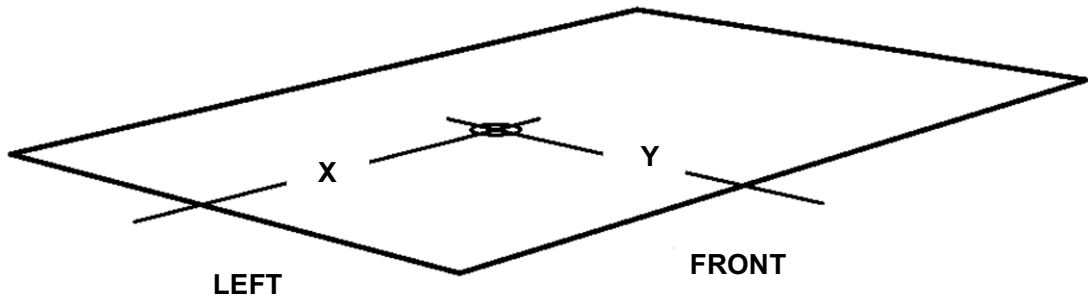


Figure 10: Center of Gravity

Table 2: XXA7, XX08-09, XX12 Corner Weights

Size (Tons)	Model	Weight (lbs.)		Center of Gravity		4 Point Load Location (lbs.)				6 Point Load Location (lbs.)					
		Shipping	Operating	X	Y	A	B	C	D	A	B	C	D	E	F
A7 (6)	XX	665	652	35.8	23.9	163	153	163	173	110	105	101	107	112	117
08 (7.5)	XX	1006	976	46.9	35.7	261	304	221	190	170	187	208	151	136	124
09 (8.5)	XX	1055	1025	48.0	35.7	267	326	238	194	172	196	225	164	143	125
12 (10)	XX	1090	1060	49.5	33.3	247	325	277	211	158	188	227	193	160	135

Table 3: XXA7, XX08-09, XX12 Unit Accessory Weights

Unit Accessory	Weights (lbs.)
Vertical Flow Dry Bulb Economizer Small Footprint	63
Horizontal Flow Dry Bulb Economizer Small Footprint Short	96
Horizontal Flow Dry Bulb Economizer Small Footprint Short	75
Horizontal Flow Dry Bulb Economizer Small Footprint Tall	81
Horizontal Flow Dry Bulb Economizer Large Footprint Short	105
Horizontal Flow Dry Bulb Economizer Large Footprint Tall	102
Power Exhaust Vert Flow Small Footprint	38
Power Exhaust Vert Flow Large Footprint	38
Power Exhaust Horiz Flow Small Footprint	38
Power Exhaust Horiz Flow Large Footprint	38
Hail Guard Kit Small Short Factory Installed	19
Hail Guard Kit Small Tall Factory Installed	24
Hail Guard Kit Large Short Factory Installed	50
Hail Guard Kit Large Tall Factory Installed	50
Curb Rigid 14" Small Footprint	145
Curb Rigid 24" Small Footprint	135
Curb Rigid 14" Large Footprint	135
Curb Rigid 24" Large Footprint	135

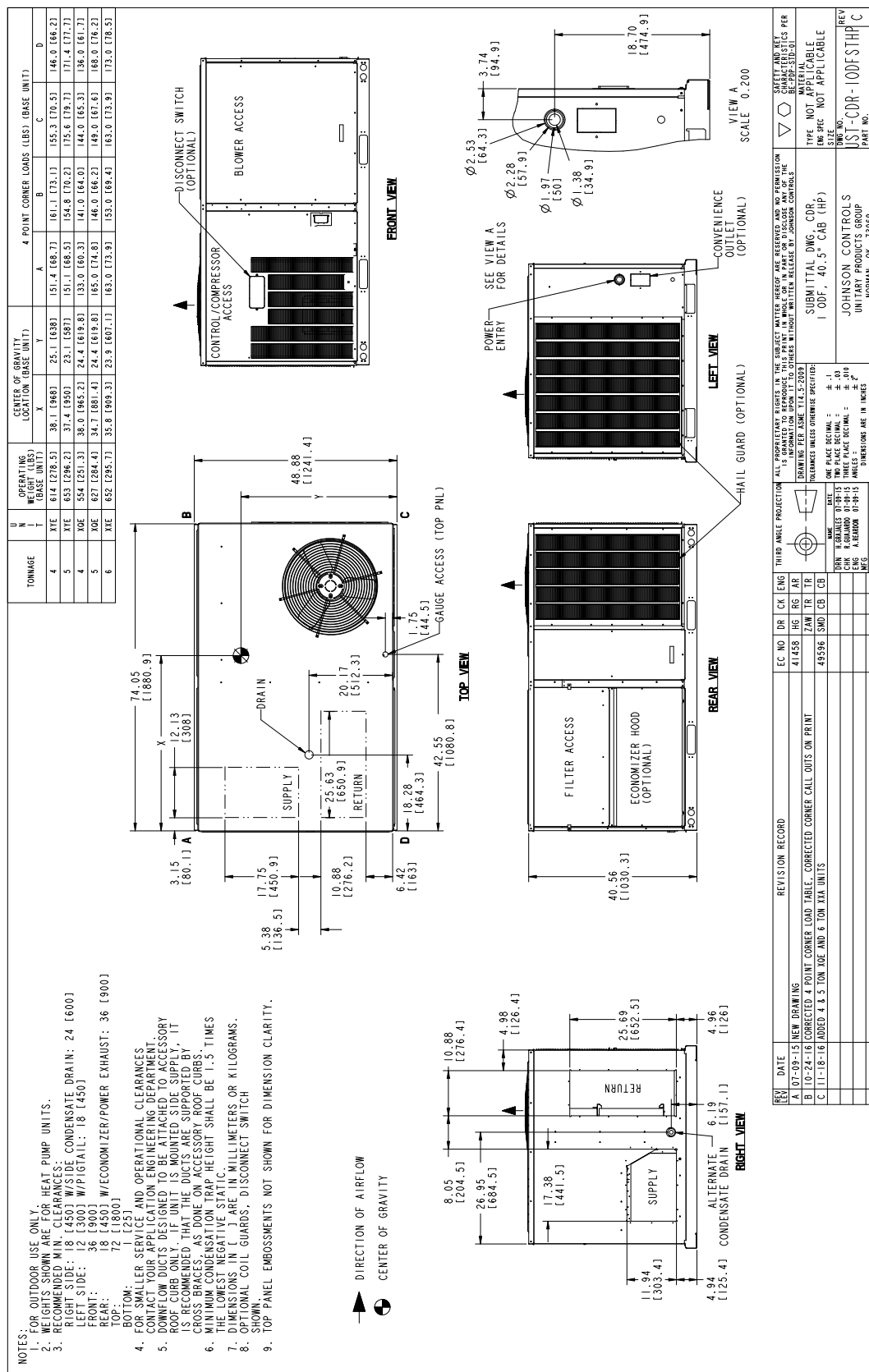
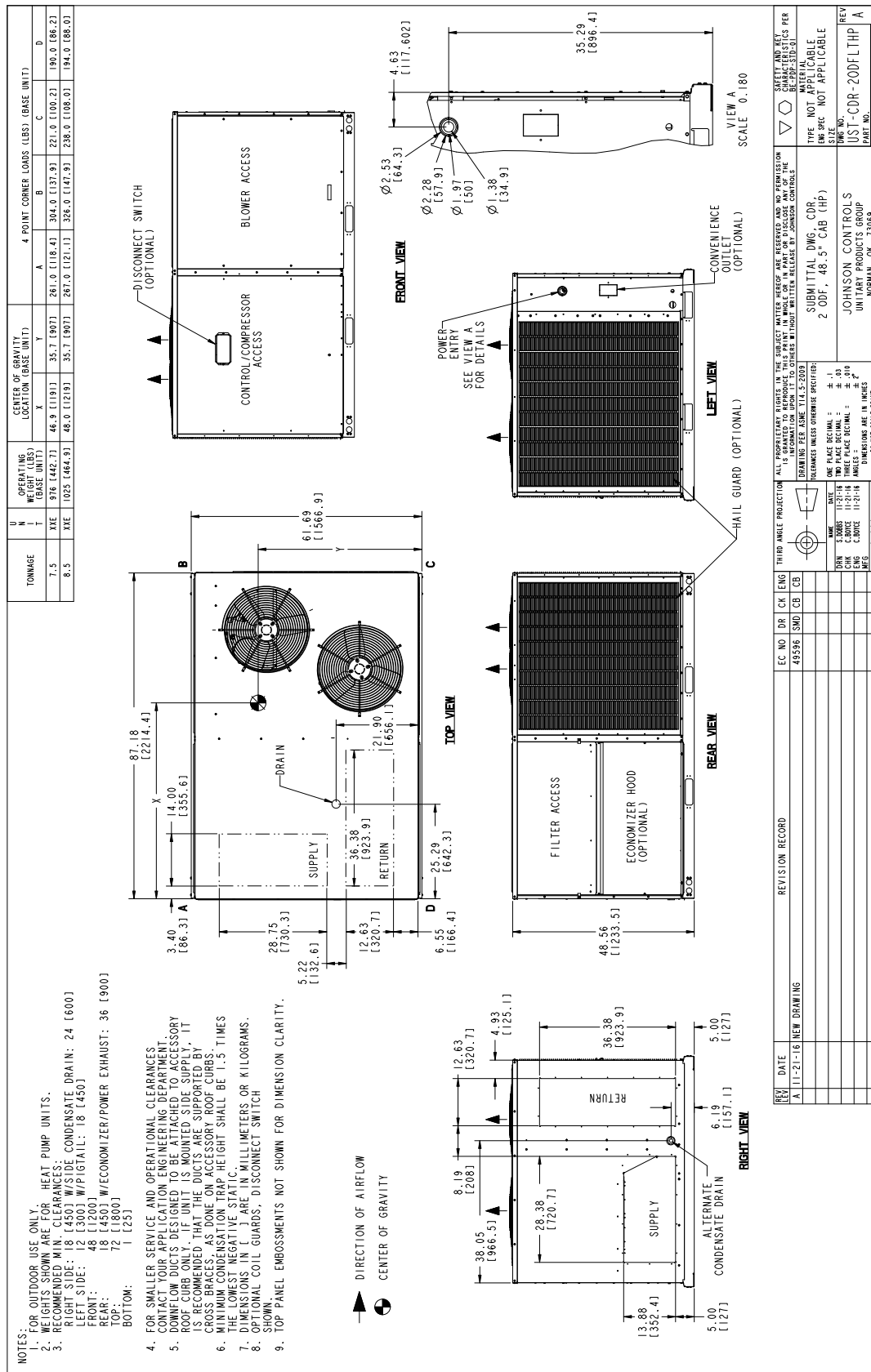


Figure 11: XXA7 Unit Dimensions



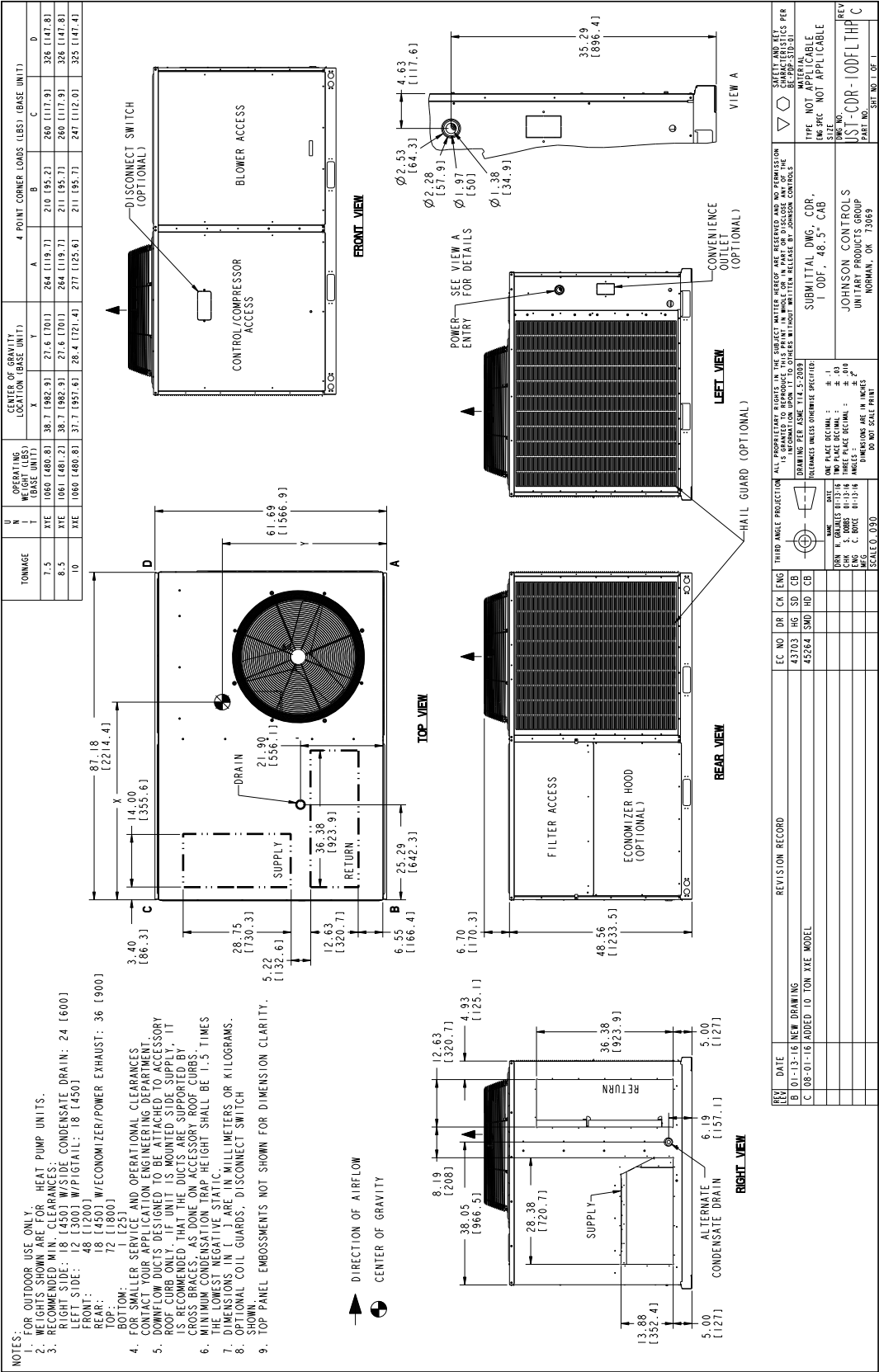


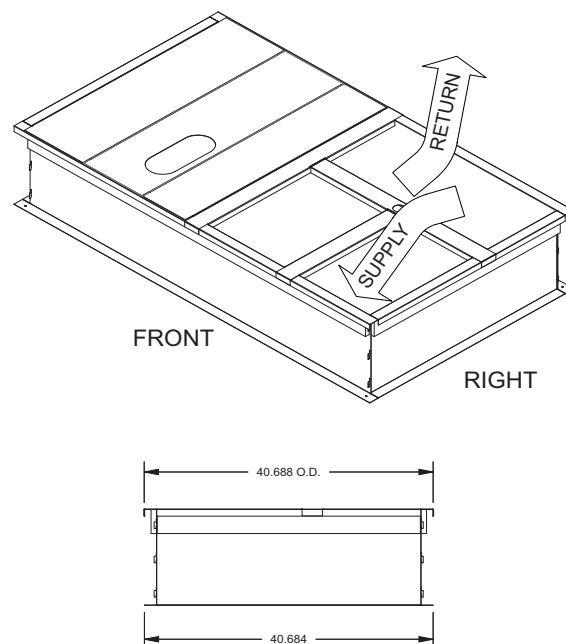
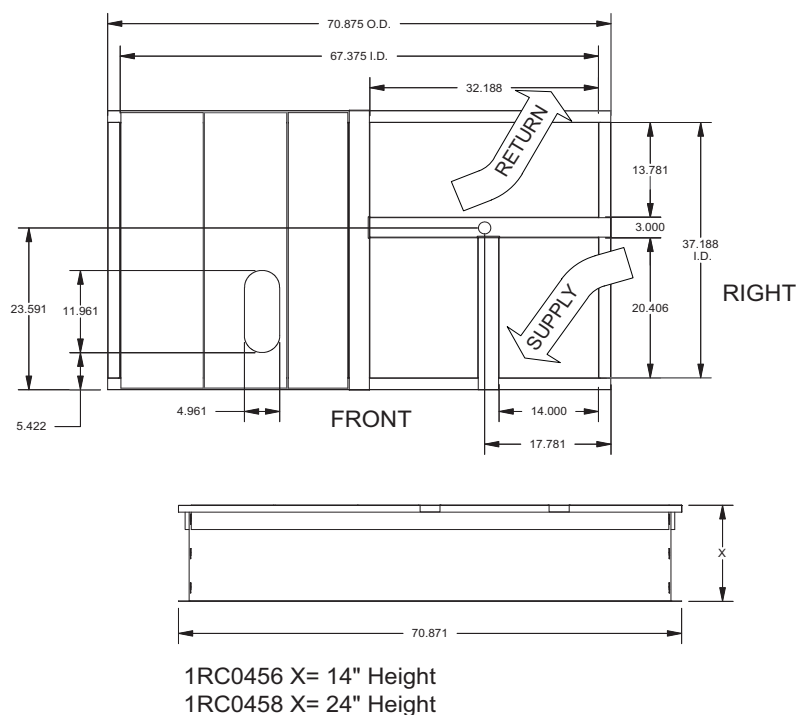
Figure 13: XX12 Unit Dimensions

Table 4: XXA7 Unit Clearances

Direction	Distance (in.)	Direction	Distance (in.)
Top ¹	72	Right	18
Front	36	Left	12
Rear	18 ² /36 ³	Bottom ⁴	1

1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
2. Units without economizer or power exhaust.
3. Units equipped with an Economizer or Power Exhaust. Flue products must not be discharged within 10 Feet of the rear of the unit.
4. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.

XXA7 Unit Roof Curb Dimensions



Notes:

1. Sides, ends and cross support are 18-G90. Deck pans, R/A & S/A supports are 20-G90.
2. Full perimeter wood nailer.
3. Insulated deck pans.

Figure 14: 1RC0456, 1RC0458 Roof Curb Dimensions

Unit Models used with 1RC0456, 1RC0458 Roof Curb

XXA7

NOTE: If utilities are required thru the base of the unit or thru the roof curb the following field installed accessories can be purchased thru your dealer or contractor:

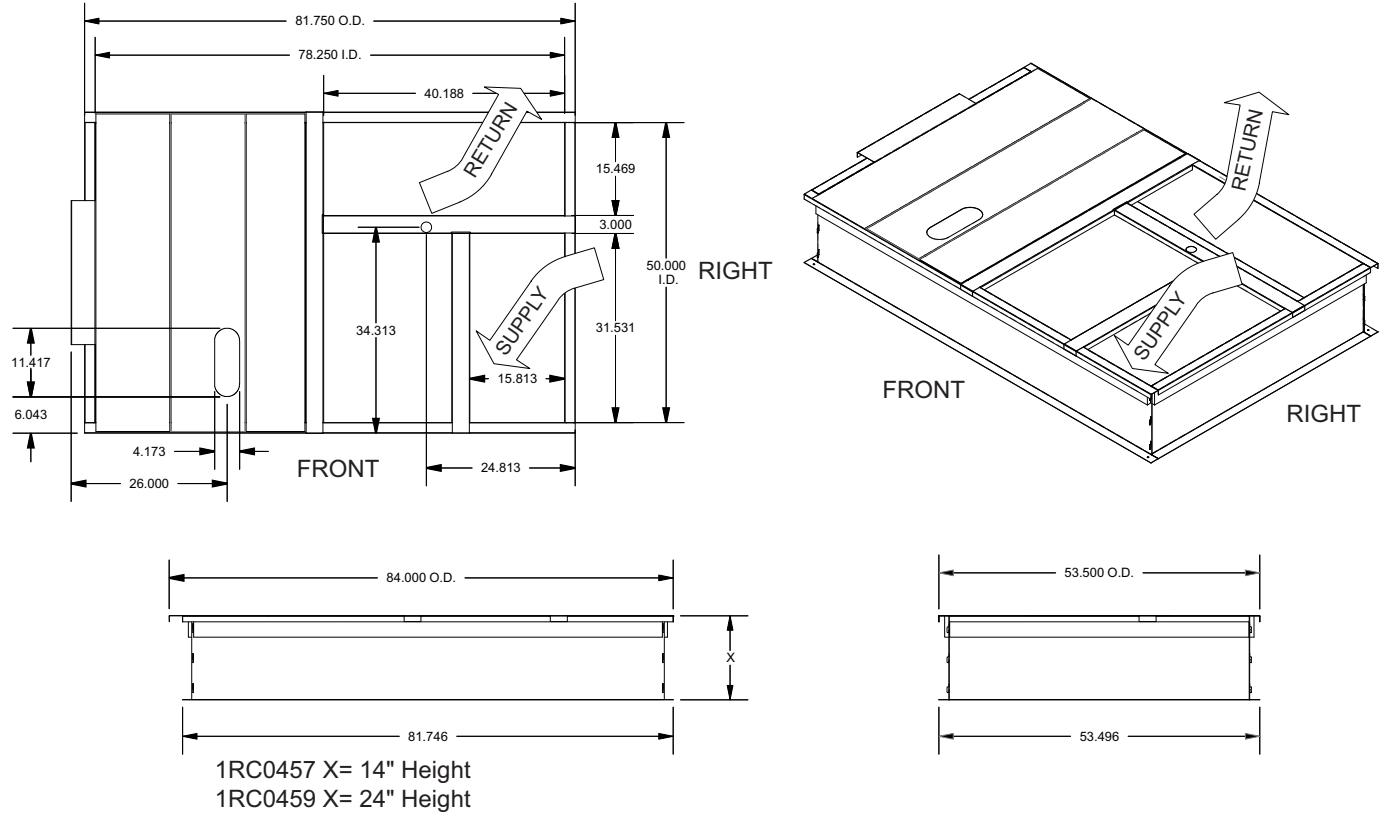
1TB0403 - Thru the base electrical

Table 5: XX08-09 and XX12 Unit Clearances

Direction	Distance (in.)	Direction	Distance (in.)
Top ¹	72	Right	18
Front	42	Left	12
Rear	18 ² /36 ³	Bottom ⁴	1

- 1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet, outdoor coil face.
- 2. Units without economizer or power exhaust.
- 3. Units equipped with an Economizer or Power Exhaust. Flue products must not be discharged within 10 Feet of the rear of the unit.
- 4. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.

XX08-09 and XX12 Unit Roof Curb Dimensions



- Notes:**
- 1. Sides, ends, unit locator and cross support are 18-G90. Deck pans, R/A & S/A supports are 20-G90.
 - 2. Full perimeter wood nailer.
 - 3. Insulated deck pans.

Figure 15: 1RC0457, 1RC0459 Roof Curb Dimensions

Table 6: Unit Models used with 1RC0457, 1RC0459 Roof Curb

XX08
XX09
XX12

NOTE: If utilities are required thru the base of the unit or thru the roof curb the following field installed accessories can be purchased thru your dealer or contractor:

1TB0404 - Thru the base electrical

Ductwork

Ductwork should be designed and sized according to the methods in Manual D or Manual Q of the Air Conditioning Contractors of America (ACCA) or as recommended by any other recognized authority such as ASHRAE or SMACNA.

A closed return duct system should be used. This will not preclude use of economizers or outdoor fresh air intake. The supply and return air duct connections at the unit should be made with flexible joints to minimize noise.

The supply and return air duct systems should be designed for the CFM and static pressure requirements of the job. They should NOT be sized to match the dimensions of the duct connections on the unit.

Refer to Figures 11 thru 13 for bottom and side air duct openings.

Duct Covers

Units are shipped with the side duct openings covered and a covering over the bottom of the unit. For side duct application, remove the side duct covers and install over the bottom duct openings. The panels removed from the side duct connections are designed to be reused by securing each panel to its respective bottom duct opening. But keep in mind that the supply and return panels are installed with the painted surface DOWN, facing the bottom duct opening. The gasket must be removed from the insulation side of the duct cover so it is not directly exposed to the heating elements. The panels are secured by sliding them into slots in the back of the duct openings and screwing them to the base of the unit with screws (Use screws removed from original panel location.). Seals around duct openings must be tight.

⚠ CAUTION

When fastening ductwork to side duct flanges on unit, insert screws through duct flanges only. DO NOT insert screws through casing. Outdoor ductwork must be insulated and water-proofed.



Figure 16: Side Duct Cover Panels

NOTE: Shown with duct connection cover panel as shipped.



Figure 17: Bottom Return Opening For Side Duct Conversion



Figure 18: Bottom Supply Opening For Side Duct Conversion

Condensate Drain

A side condensate drain is provided to facilitate condensate piping. A condensate drain connection is available through the base pan for piping inside the roof curb. Trap the connection per Figure 19. The trap and drain lines should be protected from freezing.

Plumbing must conform to local codes. Use a sealing compound on male pipe threads. Install condensate drain line from the 3/4 inch NPT female connection on the unit to an open drain.

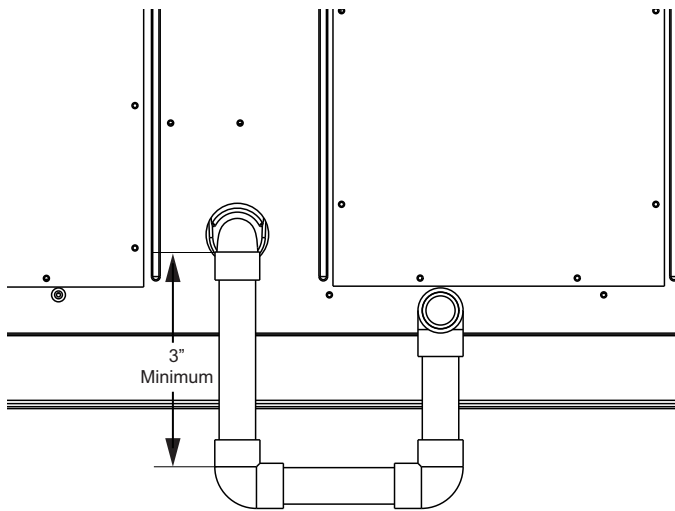


Figure 19: Condensate Drain

Compressors

The compressor used in this product is specifically designed to operate with R-410A Refrigerant and cannot be interchanged.

CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

The compressor also uses a refrigerant oil that is extremely hygroscopic, meaning it absorbs water readily. They can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Take all necessary precautions to avoid exposure of the oil to the atmosphere.

CAUTION

Do not leave the system open to the atmosphere. Unit damage could occur due to moisture being absorbed by the **refrigerant** in the system. This type of oil is highly susceptible to moisture absorption.

R-410A compressor lubricants are known to cause long term damage to some synthetic roofing materials.

CAUTION

Exposure, even if immediately cleaned up, may cause embrittlement (leading to cracking) to occur in one year or more. When performing any service that may risk exposure of compressor oil to the roof, take precautions to protect roofing.

Procedures which risk oil leakage include, but are not limited to, compressor replacement, repairing refrigerant leaks, replacing refrigerant components such as filter drier, pressure switch, metering device or coil.

Units are shipped with compressor mountings which are factory-adjusted and ready for operation.

CAUTION

Do not loosen compressor mounting bolts.

Filters

Two-inch filters are supplied with each unit. Four-inch filters may be used with no modification to the filter racks. Filters must always be installed ahead of evaporator coil and must be kept clean or replaced with same size and type. Dirty filters reduce the capacity of the unit and result in frosted coils or safety shutdown. Refer to physical data tables, for the number and size of filters needed for the unit. The unit should not be operated without filters properly installed.

Power And Control Wiring

Field wiring to the unit, fuses, and disconnects must conform to provisions of National Electrical Code (NEC), ANSI/NFPA No. 70 – Latest Edition (in U.S.A.), current Canadian Electrical Code C221, and/or local ordinances. The unit must be electrically grounded in accordance with NEC and CEC as specified above and/or local codes.

Voltage tolerances which must be maintained at the compressor terminals during starting and running conditions are indicated on the unit Rating Plate and Table 1.

CAUTION

208/230-3-60 and 208/230-1-60 units control transformers are factory wired for 230v. Change tap on transformer for 208v operation. See unit wiring diagram.

The internal wiring harnesses furnished with this unit are an integral part of the design certified unit. Field alteration to comply with electrical codes should not be required. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram and the same minimum gauge as the replaced wire.

A disconnect must be utilized for these units. Factory installed disconnects are available. If installing a disconnect (field supplied), refer to Figures 11 thru 13 for the recommended mounting location.

⚠ CAUTION

Avoid damage to internal components if drilling holes for disconnect mounting.

NOTE: Since not all local codes allow the mounting of a disconnect on the unit, please confirm compliance with local code before mounting a disconnect on the unit.

Electrical line must be sized properly to carry the load. USE COPPER CONDUCTORS ONLY. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

⚠ CAUTION

When connecting electrical power and control wiring to the unit, water-proof connectors must be used so that water or moisture cannot be drawn into the unit during normal operation. The above water-proofing conditions will also apply when installing a field supplied disconnect switch.

⚠ CAUTION

When installing equipment in a facility with a 3 phase high-leg delta power supply, care must be taken to ensure that the high-leg conductor is not attached to either of the two legs of the (single phase, direct drive) X13 or ECM motors. Failure to do so can result in the motor acting erratically or not running at all.

Check for the high leg conductor by checking voltage of each phase to ground.

Example: A or L1 phase to ground, voltage reading is 120V. B or L2 phase to ground, voltage reading is 195 to 208V. C or L3 phase to ground, voltage reading is 120V. Therefore B or L2 phase is the high Leg. The high should always be wired to the center or B or L2 tap.

Note: Check all three phase motors and compressors for proper rotation after making a change. If it is necessary to change 3 phase motor rotation, swap A or L1 and C or L3 only.

Thermostat Wiring

A two stage thermostat must be used and should be located on an inside wall approximately 56 inch above the floor where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow the manufacturer's instructions enclosed with thermostat for general installation procedure. Color-coded, insulated wires should be used to connect the thermostat to the unit. Refer to Table 7 for control wire sizing and maximum length.

Table 7: Control Wire Sizes

Wire Size	Maximum Length ¹
18 AWG	150 Feet

1. From the unit to the thermostat and back to the unit.

Table 8: Electrical Data

XXEA7-12 Standard Indoor Blower - Without Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh		
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA	
A7 (6)	208-3-60	17.6	136	27				2.3	5.2	1.1		None	-	-	-	29.5	30	45	29	163	30.6	35	45	30	166	
												10625	4.9	1	13.6	46.5	50	60	45	177	47.6	50	60	46	179	
												11125	7.9	1	21.9	56.9	60	60	54	185	58	60	70	55	188	
												11625	12	1	33.3	71.1	80	80	67	197	72.2	80	80	68	199	
	230-3-60	17.6	136	27				2.3	5.2	1		None	-	-	-	29.5	30	45	29	166	30.5	35	45	30	168	
												10625	6.5	1	15.6	49	50	60	47	182	50	50	60	48	184	
												11125	10.5	1	25.3	61.1	70	70	58	191	62.1	70	70	59	194	
												11625	16	1	38.5	77.6	80	80	73	205	78.6	80	80	74	207	
	460-3-60	8.5	66.1	13				1.3	2.6	0.5		None	-	-	-	14.5	15	20	14	82	15	15	20	15	83	
												10646	6	1	7.2	23.5	25	30	23	89	24	25	30	23	90	
												11146	11.5	1	13.8	31.8	35	35	30	95	32.3	35	35	31	96	
												11446	14	1	16.8	35.5	40	40	34	98	36	40	40	34	99	
	575-3-60	6.3	55.3	10				1.1	2	0.4		None	-	-	-	11	15	15	11	68	11.4	15	15	11	69	
	08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	5.2	1.1		None	-	-	-	40.9	45	50	43	198	43.1	45	50	46	203
													11725	12	1	33.3	82.5	90	90	81	232	84.7	90	90	84	237
													12525	18.6	1	51.6	105.4	110	110	102	250	107.6	110	110	105	255
13225													24	1	66.6	124.2	125	125	120	265	126.4	150	150	122	270	
14225													31.8	2	88.3	116.9	125	125	111	257	119.6	125	125	114	262	
230-3-60		13.8	83.1	22	13.8	83.1	22	2.3	5.2	1		None	-	-	-	40.9	45	50	43	201	42.9	45	50	45	206	
												11725	16	1	38.5	89	90	90	87	240	91	100	100	90	244	
												12525	24.8	1	59.7	115.5	125	125	112	261	117.5	125	125	114	266	
												13225	32	1	77	137.2	150	150	132	278	139.2	150	150	134	283	
												14225	42.4	2	102	134	150	150	121	269	136.5	150	150	124	274	
460-3-60		6.2	41	10	6.2	41	10	1.3	2.6	0.5		None	-	-	-	19.2	20	25	20	100	20.2	25	25	21	103	
												11746	16.5	1	19.8	44	45	45	43	120	45	45	45	44	122	
												12846	27.8	1	33.4	61	70	70	59	134	62	70	70	60	136	
												13346	33	1	39.7	68.8	70	70	66	140	69.8	70	70	67	142	
												14246	41.7	2	50.2	66	70	70	59	134	67.3	70	70	60	136	
575-3-60		4.9	33	8	4.9	33	8	1.1	2	0.4		None	-	-	-	15.2	20	20	16	81	16	20	20	17	83	
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1.1		None	-	-	-	42.4	45	50	45	228	44.6	45	50	47	233	
												11725	12	1	33.3	84	90	90	83	261	86.2	90	90	85	266	
												12525	18.6	1	51.6	106.9	110	110	104	280	109.1	110	110	106	285	
												13225	24	1	66.6	125.7	150	150	121	295	127.9	150	150	124	300	
												14225	31.8	2	88.3	116.9	125	125	113	287	119.6	125	125	115	292	
	230-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1		None	-	-	-	42.4	45	50	45	231	44.4	45	50	47	236	
												11725	16	1	38.5	90.5	100	100	89	270	92.5	100	100	91	274	
												12525	24.8	1	59.7	117	125	125	113	291	119	125	125	116	295	
												13225	32	1	77	138.7	150	150	133	308	140.7	150	150	135	313	
												14225	42.4	2	102	134	150	150	123	299	136.5	150	150	125	304	
	460-3-60	6.3	55	10	6.3	55	10	1.3	2.6	0.5		None	-	-	-	19.4	20	25	20	128	20.4	25	25	22	131	
												11746	16.5	1	19.8	44.2	45	45	43	148	45.2	50	50	44	150	
												12846	27.8	1	33.4	61.2	70	70	59	162	62.2	70	70	60	164	
												13346	33	1	39.7	69	70	70	66	168	70	70	70	67	170	
												14246	41.7	2	50.2	66	70	70	59	162	67.3	70	70	60	164	
	575-3-60	6	41	9	6	41	9	1.1	2	0.4		None	-	-	-	17.7	20	20	19	97	18.5	20	20	20	99	
											11758	17	1	16.4	38.2	40	40	37	113	39	40	40	38	115		
											13458	34	1	32.7	58.6	60	60	56	129	59.4	60	60	57	131		

XXEA7-12 Standard Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		Model	kW	Stages	Amps	FLA	LRA					FLA	LRA	FLA	LRA										
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	5.2	1.1		None	-	-	-	46.6	50	60	49	264	48.8	50	60	52	269
												11725	12	1	33.3	88.2	90	90	87	298	90.4	100	100	90	303
												12525	18.6	1	51.6	111.1	125	125	108	316	113.3	125	125	111	321
												13225	24	1	66.6	129.9	150	150	126	331	132.1	150	150	128	336
												14225	31.8	2	88.3	120.5	125	125	117	324	122.7	125	125	119	329
	230-3-60	15.6	110	24	16	110	25	5.2	5.2	1		None	-	-	-	46	50	60	48	264	48	50	60	51	269
												11725	16	1	38.5	94.1	100	100	93	303	96.1	100	100	95	307
												12525	24.8	1	59.7	120.6	125	125	117	324	122.6	125	125	119	328
												13225	32	1	77	142.3	150	150	137	341	144.3	150	150	139	346
												14225	42.4	2	102	134	150	150	127	332	136.5	150	150	129	337
	460-3-60	7.8	52	12	7.8	52	12	2.9	2.6	0.5		None	-	-	-	23.1	25	30	24	128	24.1	25	30	25	130
												11746	16.5	1	19.8	47.9	50	50	47	147	48.9	50	50	48	150
												12846	27.8	1	33.4	64.9	70	70	63	161	65.9	70	70	64	163
												13346	33	1	39.7	72.7	80	80	70	167	73.7	80	80	71	169
												14246	41.7	2	50.2	66	70	70	63	161	67.3	70	70	64	163
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	2	0.4		None	-	-	-	17.2	20	20	18	99	18	20	20	19	101
												11758	17	1	16.4	37.7	40	40	37	116	38.5	40	40	38	117
												13458	34	1	32.7	58.1	60	60	56	132	58.9	60	60	57	134
	With VFD																								
	A7 (6)	208-3-60	17.6	136	27				2.3	7	1.1		None	-	-	-	31.3	35	45	31	201	32.4	35	50	32
10625													4.9	1	13.6	48.3	50	60	47	215	49.4	50	60	48	217
11125													7.9	1	21.9	58.7	60	70	56	223	59.8	60	70	57	225
11625													12	1	33.3	72.9	80	80	69	234	74	80	80	70	237
None													-	-	-	31.5	35	45	31	203	32.5	35	50	32	205
230-3-60		17.6	136	27				2.3	7.2	1		10625	6.5	1	15.6	51	60	60	49	218	52	60	60	50	221
												11125	10.5	1	25.3	63.1	70	70	60	228	64.1	70	70	61	230
												11625	16	1	38.5	79.6	80	80	75	241	80.6	90	90	77	244
												None	-	-	-	15.5	20	20	15	100	16	20	20	16	101
												10646	6	1	7.2	24.5	25	30	24	107	25	25	30	24	108
460-3-60		8.5	66.1	13				1.3	3.6	0.5		11146	11.5	1	13.8	32.8	35	35	31	114	33.3	35	35	32	115
												11446	14	1	16.8	36.5	40	40	35	117	37	40	40	35	118
	None											-	-	-	11.5	15	15	11	75	11.9	15	15	12	76	
575-3-60	6.3	55.3	10				1.1	2.5	0.4		None	-	-	-	11.5	15	15	11	75	11.9	15	15	12	76	
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7	1.1		None	-	-	-	42.7	45	50	45	236	44.9	45	50	48	241
												11725	12	1	33.3	84.3	90	90	83	269	86.5	90	90	86	274
												12525	18.6	1	51.6	107.2	110	110	104	288	109.4	110	110	107	293
												13225	24	1	66.6	126	150	150	122	303	128.2	150	150	124	308
												14225	31.8	2	88.3	119.1	125	125	113	295	121.9	125	125	116	300
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7.2	1		None	-	-	-	42.9	45	50	45	238	44.9	45	50	48	243
												11725	16	1	38.5	91	100	100	90	277	93	100	100	92	281
												12525	24.8	1	59.7	117.5	125	125	114	298	119.5	125	125	116	302
												13225	32	1	77	139.2	150	150	134	315	141.2	150	150	136	320
												14225	42.4	2	102	136.5	150	150	124	306	139	150	150	126	311
	460-3-60	6.2	41	10	6.2	41	10	1.3	3.6	0.5		None	-	-	-	20.2	25	25	21	119	21.2	25	25	23	121
												11746	16.5	1	19.8	45	45	45	44	139	46	50	50	45	141
												12846	27.8	1	33.4	62	70	70	60	152	63	70	70	61	154
												13346	33	1	39.7	69.8	70	70	67	158	70.8	80	80	68	161
												14246	41.7	2	50.2	67.3	70	70	60	152	68.5	70	70	61	154
	575-3-60	4.9	33	8	4.9	33	8	1.1	2.5	0.4		None	-	-	-	15.7	20	20	17	88	16.5	20	20	18	90
												11758	17	1	16.4	36.2	40	40	36	105	37	40	40	36	107
												13458	34	1	32.7	56.6	60	60	54	121	57.4	60	60	55	123

XXEA7-12 Standard Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ^{2/} / Breaker ³ Size (Amps)	Max Fuse ^{2/} / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ^{2/} / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ^{2/} / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ^{4/} Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	7	1.1		None	-	-	-	44.2	45	50	47	266	46.4	50	50	49	271
												11725	12	1	33.3	85.8	90	90	85	299	88	90	90	88	304
												12525	18.6	1	51.6	108.7	110	110	106	317	110.9	125	125	109	322
												13225	24	1	66.6	127.5	150	150	123	332	129.7	150	150	126	337
												14225	31.8	2	88.3	119.1	125	125	115	325	121.9	125	125	117	330
	230-3-60	14.5	98	23	14.5	98	23	2.3	7.2	1		None	-	-	-	44.4	45	50	47	268	46.4	50	60	49	272
												11725	16	1	38.5	92.5	100	100	91	306	94.5	100	100	93	311
												12525	24.8	1	59.7	119	125	125	116	328	121	125	125	118	332
												13225	32	1	77	140.7	150	150	135	345	142.7	150	150	138	349
												14225	42.4	2	102	136.5	150	150	125	336	139	150	150	128	341
	460-3-60	6.3	55	10	6.3	55	10	1.3	3.6	0.5		None	-	-	-	20.4	25	25	22	147	21.4	25	25	23	149
												11746	16.5	1	19.8	45.2	50	50	44	167	46.2	50	50	46	169
												12846	27.8	1	33.4	62.2	70	70	60	180	63.2	70	70	61	182
												13346	33	1	39.7	70	70	70	67	186	71	80	80	68	189
												14246	41.7	2	50.2	67.3	70	70	60	180	68.5	70	70	61	182
	575-3-60	6	41	9	6	41	9	1.1	2.5	0.4		None	-	-	-	18.2	20	20	19	104	19	20	20	20	106
												11758	17	1	16.4	38.7	40	40	38	121	39.5	40	40	39	123
												13458	34	1	32.7	59.1	60	60	57	137	59.9	60	60	58	139
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	7	1.1		None	-	-	-	48.4	50	60	51	302	50.6	60	60	54	307
												11725	12	1	33.3	90	90	90	89	335	92.2	100	100	92	340
												12525	18.6	1	51.6	112.9	125	125	110	354	115.1	125	125	113	359
												13225	24	1	66.6	131.7	150	150	128	369	133.9	150	150	130	374
												14225	31.8	2	88.3	122.3	125	125	119	361	124.5	125	125	122	366
	230-3-60	15.6	110	24	16	110	25	5.2	7.2	1		None	-	-	-	48	50	60	51	301	50	50	60	53	305
												11725	16	1	38.5	96.1	100	100	95	339	98.1	100	100	97	344
												12525	24.8	1	59.7	122.6	125	125	119	361	124.6	125	125	122	365
												13225	32	1	77	144.3	150	150	139	378	146.3	150	150	141	382
												14225	42.4	2	102	136.5	150	150	129	369	139	150	150	131	374
	460-3-60	7.8	52	12	7.8	52	12	2.9	3.6	0.5		None	-	-	-	24.1	25	30	25	146	25.1	30	30	27	148
												11746	16.5	1	19.8	48.9	50	50	48	166	49.9	50	50	49	168
												12846	27.8	1	33.4	65.9	70	70	64	179	66.9	70	70	65	182
												13346	33	1	39.7	73.7	80	80	71	186	74.7	80	80	72	188
												14246	41.7	2	50.2	67.3	70	70	64	179	68.5	70	70	65	182
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	2.5	0.4		None	-	-	-	17.7	20	20	19	107	18.5	20	20	20	109
												11758	17	1	16.4	38.2	40	40	37	123	39	40	40	38	125
												13458	34	1	32.7	58.6	60	60	56	140	59.4	60	60	57	141

1. Minimum Circuit Ampacity.

2. Dual Element, Time Delay Type.

3. HACR type per NEC.

4. Non-fused Disconnect, Verify on the unit nameplate that the disconnect is properly sized for the application. Units with field installed electric heat kits may exceed the factory installed disconnect amperage rating.

XXEA7-12 Standard Indoor Blower - With Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴	MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh		
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps								FLA	LRA	
A7 (6)	208-3-60	17.6	136	27				2.3	5.2	1.1	8.6	None	-	-	-	33.8	35	50	34	168	34.9	35	50	35	170
												10625	4.9	1	13.6	50.8	60	60	49	181	51.9	60	60	51	184
												11125	7.9	1	21.9	61.2	70	70	59	189	62.3	70	70	60	192
												11625	12	1	33.3	75.4	80	80	72	201	76.5	80	80	73	203
	230-3-60	17.6	136	27				2.3	5.2	1	8.6	None	-	-	-	33.8	35	50	34	170	34.8	35	50	35	173
												10625	6.5	1	15.6	53.3	60	60	52	186	54.3	60	60	53	188
												11125	10.5	1	25.3	65.4	70	70	63	196	66.4	70	70	64	198
												11625	16	1	38.5	81.9	90	90	78	209	82.9	90	90	79	211
	460-3-60	8.5	66.1	13				1.3	2.6	0.5	8.6	None	-	-	-	16.7	20	25	17	84	17.2	20	25	17	85
												10646	6	1	7.2	25.7	30	30	25	91	26.2	30	30	26	92
												11146	11.5	1	13.8	34	35	35	33	97	34.5	35	35	33	99
												11446	14	1	16.8	37.7	40	40	36	100	38.2	40	40	37	102
575-3-60	6.3	55.3	10				1.1	2	0.4	8.6	None	-	-	-	12.7	15	15	13	69	13	70				
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	5.2	1.1	8.6	None	-	-	-	45.2	50	50	48	203	47.4	50	60	50	208
												11725	12	1	33.3	86.8	90	90	86	236	89	90	90	89	241
												12525	18.6	1	51.6	109.7	110	110	107	254	111.9	125	125	110	259
												13225	24	1	66.6	128.5	150	150	125	269	130.7	150	150	127	274
												14225	31.8	2	88.3	122.3	125	125	116	262	125	150	150	118	267
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	5.2	1	8.6	None	-	-	-	45.2	50	50	48	206	47.2	50	60	50	210
												11725	16	1	38.5	93.3	100	100	92	244	95.3	100	100	95	249
												12525	24.8	1	59.7	119.8	125	125	117	265	121.8	125	125	119	270
												13225	32	1	77	141.5	150	150	137	283	143.5	150	150	139	287
												14225	42.4	2	102	139.4	150	150	126	274	141.9	150	150	129	278
	460-3-60	6.2	41	10	6.2	41	10	1.3	2.6	0.5	8.6	None	-	-	-	21.4	25	25	23	102	22.4	25	25	24	105
												11746	16.5	1	19.8	46.2	50	50	46	122	47.2	50	50	47	124
												12846	27.8	1	33.4	63.2	70	70	61	136	64.2	70	70	62	138
												13346	33	1	39.7	71	80	80	68	142	72	80	80	70	144
												14246	41.7	2	50.2	68.7	70	70	61	136	69.9	70	70	62	138
	575-3-60	4.9	33	8	4.9	33	8	1.1	2	0.4	8.6	None	-	-	-	16.9	20	20	18	82	17.7	20	20	19	84
												11758	17	1	16.4	37.4	40	40	37	99	38.2	40	40	38	101
												13458	34	1	32.7	57.8	60	60	56	115	58.6	60	60	57	117
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1.1	8.6	None	-	-	-	46.7	50	60	50	232	48.9	50	60	52	237
												11725	12	1	33.3	88.3	90	90	88	266	90.5	100	100	90	271
												12525	18.6	1	51.6	111.2	125	125	109	284	113.4	125	125	111	289
												13225	24	1	66.6	130	150	150	126	299	132.2	150	150	129	304
												14225	31.8	2	88.3	122.3	125	125	118	291	125	150	150	120	296
	230-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1	8.6	None	-	-	-	46.7	50	60	50	235	48.7	50	60	52	240
												11725	16	1	38.5	94.8	100	100	94	274	96.8	100	100	96	278
												12525	24.8	1	59.7	121.3	125	125	118	295	123.3	125	125	121	300
												13225	32	1	77	143	150	150	138	312	145	150	150	140	317
												14225	42.4	2	102	139.4	150	150	128	303	141.9	150	150	130	308
	460-3-60	6.3	55	10	6.3	55	10	1.3	2.6	0.5	8.6	None	-	-	-	21.6	25	25	23	130	22.6	25	25	24	133
												11746	16.5	1	19.8	46.4	50	50	46	150	47.4	50	50	47	152
												12846	27.8	1	33.4	63.4	70	70	61	164	64.4	70	70	63	166
												13346	33	1	39.7	71.2	80	80	69	170	72.2	80	80	70	172
												14246	41.7	2	50.2	68.7	70	70	61	164	69.9	70	70	63	166
	575-3-60	6	41	9	6	41	9	1.1	2	0.4	8.6	None	-	-	-	19.4	20	25	21	98	20.2	25	25	22	100
												11758	17	1	16.4	39.9	40	40	39	115	40.7	45	45	40	117
												13458	34	1	32.7	60.3	70	70	58	131	61.1	70	70	59	133

XXEA7-12 Standard Indoor Blower - With Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ^{2/} Breaker ³ Size (Amps)	Max Fuse ^{2/} Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ w/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	5.2	1.1	8.6	None	-	-	-	50.9	60	60	54	269	53.1	60	60	56	274
												11725	12	1	33.3	92.5	100	100	92	302	94.7	100	100	95	307
												12525	18.6	1	51.6	115.4	125	125	113	320	117.6	125	125	116	325
												13225	24	1	66.6	134.2	150	150	131	335	136.4	150	150	133	340
	230-3-60	15.6	110	24	16	110	25	5.2	5.2	1	8.6	None	-	-	-	50.3	60	60	53	268	52.3	60	60	56	273
												11725	16	1	38.5	98.4	100	100	98	307	100.4	110	110	100	311
												12525	24.8	1	59.7	124.9	125	125	122	328	126.9	150	150	124	333
												13225	32	1	77	146.6	150	150	142	345	148.6	150	150	144	350
	460-3-60	7.8	52	12	7.8	52	12	2.9	2.6	0.5	8.6	None	-	-	-	25.3	30	30	27	130	26.3	30	30	28	132
												11746	16.5	1	19.8	50.1	60	60	50	149	51.1	60	60	51	152
												12846	27.8	1	33.4	67.1	70	70	65	163	68.1	70	70	66	165
												13346	33	1	39.7	74.9	80	80	72	169	75.9	80	80	74	172
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	2	0.4	8.6	None	-	-	-	18.9	20	20	20	101	19.7	20	20	21	103
												11758	17	1	16.4	39.4	40	40	39	117	40.2	45	45	40	119
												13458	34	1	32.7	59.8	60	60	58	134	60.6	70	70	59	135
												With VFD													
A7 (6)	208-3-60	17.6	136	27				2.3	7	1.1	8.6	None	-	-	-	35.6	40	50	36	205	36.7	40	50	37	208
												10625	4.9	1	13.6	52.6	60	60	52	219	53.7	60	60	53	221
												11125	7.9	1	21.9	63	70	70	61	227	64.1	70	70	62	230
												11625	12	1	33.3	77.2	80	80	74	239	78.3	80	80	75	241
	230-3-60	17.6	136	27				2.3	7.2	1	8.6	None	-	-	-	35.8	40	50	36	207	36.8	40	50	37	209
												10625	6.5	1	15.6	55.3	60	60	54	223	56.3	60	70	55	225
												11125	10.5	1	25.3	67.4	70	70	65	232	68.4	70	70	66	235
												11625	16	1	38.5	83.9	90	90	80	246	84.9	90	90	82	248
	460-3-60	8.5	66.1	13				1.3	3.6	0.5	8.6	None	-	-	-	17.7	20	25	18	102	18.2	20	25	19	103
												10646	6	1	7.2	26.7	30	30	26	109	27.2	30	30	27	110
												11146	11.5	1	13.8	35	35	40	34	116	35.5	40	40	34	117
												11446	14	1	16.8	38.7	40	40	37	119	39.2	40	40	38	120
	575-3-60	6.3	55.3	10				1.1	2.5	0.4	8.6	None	-	-	-	13.2	15	15	13	77	13.6	15	15	14	78
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7	1.1	8.6	None	-	-	-	47	50	60	50	240	49.2	50	60	53	245
												11725	12	1	33.3	88.6	90	90	88	274	90.8	100	100	91	279
												12525	18.6	1	51.6	111.5	125	125	109	292	113.7	125	125	112	297
												13225	24	1	66.6	130.3	150	150	127	307	132.5	150	150	129	312
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7.2	1	8.6	None	-	-	-	47.2	50	60	50	242	49.2	50	60	53	247
												11725	16	1	38.5	95.3	100	100	95	281	97.3	100	100	97	285
												12525	24.8	1	59.7	121.8	125	125	119	302	123.8	125	125	121	307
												13225	32	1	77	143.5	150	150	139	319	145.5	150	150	141	324
	460-3-60	6.2	41	10	6.2	41	10	1.3	3.6	0.5	8.6	None	-	-	-	22.4	25	25	24	121	23.4	25	25	25	123
												11746	16.5	1	19.8	47.2	50	50	47	141	48.2	50	50	48	143
												12846	27.8	1	33.4	64.2	70	70	62	154	65.2	70	70	63	156
												13346	33	1	39.7	72	80	80	70	161	73	80	80	71	163
	575-3-60	4.9	33	8	4.9	33	8	1.1	2.5	0.4	8.6	None	-	-	-	17.4	20	20	19	90	18.2	20	20	20	92
												11758	17	1	16.4	37.9	40	40	37	107	38.7	40	40	38	108
												13458	34	1	32.7	58.3	60	60	56	123	59.1	60	60	57	125

XXEA7-12 Standard Indoor Blower - With Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ^{2/} / Breaker ³ Size (Amps)	Max Fuse ^{2/} / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ^{2/} / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ^{2/} / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ^{4/} Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	7	1.1	8.6	None	-	-	-	48.5	50	60	52	270	50.7	60	60	54	275
												11725	12	1	33.3	90.1	100	100	90	303	92.3	100	100	92	308
												12525	18.6	1	51.6	113	125	125	111	322	115.2	125	125	114	327
												13225	24	1	66.6	131.8	150	150	128	337	134	150	150	131	342
												14225	31.8	2	88.3	124.5	125	125	120	329	127.3	150	150	122	334
	230-3-60	14.5	98	23	14.5	98	23	2.3	7.2	1	8.6	None	-	-	-	48.7	50	60	52	272	50.7	60	60	54	277
												11725	16	1	38.5	96.8	100	100	96	311	98.8	100	100	98	315
												12525	24.8	1	59.7	123.3	125	125	121	332	125.3	150	150	123	336
												13225	32	1	77	145	150	150	140	349	147	150	150	143	354
												14225	42.4	2	102	141.9	150	150	130	340	144.4	150	150	132	345
	460-3-60	6.3	55	10	6.3	55	10	1.3	3.6	0.5	8.6	None	-	-	-	22.6	25	25	24	149	23.6	25	25	25	151
												11746	16.5	1	19.8	47.4	50	50	47	169	48.4	50	50	48	171
												12846	27.8	1	33.4	64.4	70	70	63	182	65.4	70	70	64	184
												13346	33	1	39.7	72.2	80	80	70	189	73.2	80	80	71	191
												14246	41.7	2	50.2	69.9	70	70	63	182	71.2	80	80	64	184
	575-3-60	6	41	9	6	41	9	1.1	2.5	0.4	8.6	None	-	-	-	19.9	20	25	21	106	20.7	25	25	22	108
												11758	17	1	16.4	40.4	45	45	40	123	41.2	45	45	41	124
												13458	34	1	32.7	60.8	70	70	59	139	61.6	70	70	60	141
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	7	1.1	8.6	None	-	-	-	52.7	60	60	56	306	54.9	60	60	59	311
												11725	12	1	33.3	94.3	100	100	94	340	96.5	100	100	97	345
												12525	18.6	1	51.6	117.2	125	125	115	358	119.4	125	125	118	363
												13225	24	1	66.6	136	150	150	133	373	138.2	150	150	135	378
												14225	31.8	2	88.3	126.6	150	150	124	366	128.8	150	150	127	371
	230-3-60	15.6	110	24	16	110	25	5.2	7.2	1	8.6	None	-	-	-	52.3	60	60	56	305	54.3	60	70	58	310
												11725	16	1	38.5	100.4	110	110	100	344	102.4	110	110	102	348
												12525	24.8	1	59.7	126.9	150	150	124	365	128.9	150	150	127	369
												13225	32	1	77	148.6	150	150	144	382	150.6	175	175	146	387
												14225	42.4	2	102	141.9	150	150	134	373	144.4	150	150	136	378
	460-3-60	7.8	52	12	7.8	52	12	2.9	3.6	0.5	8.6	None	-	-	-	26.3	30	30	28	148	27.3	30	30	29	150
												11746	16.5	1	19.8	51.1	60	60	51	168	52.1	60	60	52	170
												12846	27.8	1	33.4	68.1	70	70	66	181	69.1	70	70	68	184
												13346	33	1	39.7	75.9	80	80	74	188	76.9	80	80	75	190
												14246	41.7	2	50.2	69.9	70	70	66	181	71.2	80	80	68	184
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	2.5	0.4	8.6	None	-	-	-	19.4	20	25	21	109	20.2	25	25	22	110
												11758	17	1	16.4	39.9	40	40	39	125	40.7	45	45	40	127
												13458	34	1	32.7	60.3	70	70	58	141	61.1	70	70	59	143

1. Minimum Circuit Ampacity.

2. Dual Element, Time Delay Type.

3. HACR type per NEC.

4. Non-fused Disconnect, Verify on the unit nameplate that the disconnect is properly sized for the application. Units with field installed electric heat kits may exceed the factory installed disconnect amperage rating.

XXEA7-12 Medium Indoor Blower - Without Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh		
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA	
A7 (6)	208-3-60	17.6	136	27				2.3	7.5	1.1		None	-	-	-	31.8	35	45	32	189	32.9	35	50	33	192	
												10625	4.9	1	13.6	48.8	50	60	47	203	49.9	50	60	48	206	
												11125	7.9	1	21.9	59.2	60	70	57	211	60.3	70	70	58	214	
												11625	12	1	33.3	73.4	80	80	70	223	74.5	80	80	71	225	
	230-3-60	17.6	136	27				2.3	7.5	1		None	-	-	-	31.8	35	45	32	196	32.8	35	50	33	198	
												10625	6.5	1	15.6	51.3	60	60	49	212	52.3	60	60	51	214	
												11125	10.5	1	25.3	63.4	70	70	61	221	64.4	70	70	62	224	
												11625	16	1	38.5	79.9	80	80	76	235	80.9	90	90	77	237	
	460-3-60	8.5	66.1	13				1.3	3.4	0.5		None	-	-	-	15.3	20	20	15	97	15.8	20	20	16	98	
												10646	6	1	7.2	24.3	25	30	23	104	24.8	25	30	24	105	
												11146	11.5	1	13.8	32.6	35	35	31	110	33.1	35	35	32	111	
												11446	14	1	16.8	36.3	40	40	35	113	36.8	40	40	35	114	
	575-3-60	6.3	55.3	10				1.1	2.8	0.4		None	-	-	-	11.8	15	15	12	80	12.2	15	15	12	81	
	08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	5.2	1.1		None	-	-	-	40.9	45	50	43	198	43.1	45	50	46	203
													11725	12	1	33.3	82.5	90	90	81	232	84.7	90	90	84	237
													12525	18.6	1	51.6	105.4	110	110	102	250	107.6	110	110	105	255
13225													24	1	66.6	124.2	125	125	120	265	126.4	150	150	122	270	
14225													31.8	2	88.3	116.9	125	125	111	257	119.6	125	125	114	262	
230-3-60		13.8	83.1	22	13.8	83.1	22	2.3	5.2	1		None	-	-	-	40.9	45	50	43	201	42.9	45	50	45	206	
												11725	16	1	38.5	89	90	90	87	240	91	100	100	90	244	
												12525	24.8	1	59.7	115.5	125	125	112	261	117.5	125	125	114	266	
												13225	32	1	77	137.2	150	150	132	278	139.2	150	150	134	283	
												14225	42.4	2	102	134	150	150	121	269	136.5	150	150	124	274	
460-3-60		6.2	41	10	6.2	41	10	1.3	2.6	0.5		None	-	-	-	19.2	20	25	20	100	20.2	25	25	21	103	
												11746	16.5	1	19.8	44	45	45	43	120	45	45	45	44	122	
												12846	27.8	1	33.4	61	70	70	59	134	62	70	70	60	136	
												13346	33	1	39.7	68.8	70	70	66	140	69.8	70	70	67	142	
												14246	41.7	2	50.2	66	70	70	59	134	67.3	70	70	60	136	
575-3-60		4.9	33	8	4.9	33	8	1.1	2	0.4		None	-	-	-	15.2	20	20	16	81	16	20	20	17	83	
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1.1		None	-	-	-	42.4	45	50	45	228	44.6	45	50	47	233	
												11725	12	1	33.3	84	90	90	83	261	86.2	90	90	85	266	
												12525	18.6	1	51.6	106.9	110	110	104	280	109.1	110	110	106	285	
												13225	24	1	66.6	125.7	150	150	121	295	127.9	150	150	124	300	
												14225	31.8	2	88.3	116.9	125	125	113	287	119.6	125	125	115	292	
	230-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1		None	-	-	-	42.4	45	50	45	231	44.4	45	50	47	236	
												11725	16	1	38.5	90.5	100	100	89	270	92.5	100	100	91	274	
												12525	24.8	1	59.7	117	125	125	113	291	119	125	125	116	295	
												13225	32	1	77	138.7	150	150	133	308	140.7	150	150	135	313	
												14225	42.4	2	102	134	150	150	123	299	136.5	150	150	125	304	
	460-3-60	6.3	55	10	6.3	55	10	1.3	2.6	0.5		None	-	-	-	19.4	20	25	20	128	20.4	25	25	22	131	
												11746	16.5	1	19.8	44.2	45	45	43	148	45.2	50	50	44	150	
												12846	27.8	1	33.4	61.2	70	70	59	162	62.2	70	70	60	164	
												13346	33	1	39.7	69	70	70	66	168	70	70	70	67	170	
												14246	41.7	2	50.2	66	70	70	59	162	67.3	70	70	60	164	
	575-3-60	6	41	9	6	41	9	1.1	2	0.4		None	-	-	-	17.7	20	20	19	97	18.5	20	20	20	99	
											11758	17	1	16.4	38.2	40	40	37	113	39	40	40	38	115		
											13458	34	1	32.7	58.6	60	60	56	129	59.4	60	60	57	131		

XXEA7-12 Medium Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh		
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA	
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	10.2	1.1		None	-	-	-	51.6	60	60	55	305	53.8	60	60	57	310	
												11725	12	1	33.3	93.2	100	100	93	339	95.4	100	100	96	344	
												12525	18.6	1	51.6	116.1	125	125	114	357	118.3	125	125	117	362	
												13225	24	1	66.6	134.9	150	150	131	372	137.1	150	150	134	377	
												14225	31.8	2	88.3	125.5	150	150	123	364	127.7	150	150	125	369	
	230-3-60	15.6	110	24	16	110	25	5.2	10.2	1		None	-	-	-	51	60	60	54	308	53	60	60	56	313	
												11725	16	1	38.5	99.1	100	100	98	347	101.1	110	110	101	351	
												12525	24.8	1	59.7	125.6	150	150	123	368	127.6	150	150	125	372	
												13225	32	1	77	147.3	150	150	143	385	149.3	150	150	145	390	
												14225	42.4	2	102	140.3	150	150	132	376	142.8	150	150	135	381	
	460-3-60	7.8	52	12	7.8	52	12	2.9	4.8	0.5		None	-	-	-	25.3	30	30	27	150	26.3	30	30	28	152	
												11746	16.5	1	19.8	50.1	60	60	50	169	51.1	60	60	51	172	
												12846	27.8	1	33.4	67.1	70	70	65	183	68.1	70	70	66	185	
												13346	33	1	39.7	74.9	80	80	72	189	75.9	80	80	74	191	
												14246	41.7	2	50.2	68.8	70	70	65	183	70	70	70	66	185	
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	3.4	0.4		None	-	-	-	18.6	20	20	20	117	19.4	20	20	21	119	
												11758	17	1	16.4	39.1	40	40	39	133	39.9	40	40	39	135	
												13458	34	1	32.7	59.5	60	60	57	149	60.3	70	70	58	151	
	With VFD																									
A7 (6)	208-3-60	17.6	136	27				2.3	8.9	1.1		None	-	-	-	33.2	35	50	33	218	34.3	35	50	34	220	
												10625	4.9	1	13.6	50.2	60	60	49	231	51.3	60	60	50	234	
												11125	7.9	1	21.9	60.6	70	70	58	240	61.7	70	70	60	242	
												11625	12	1	33.3	74.8	80	80	71	251	75.9	80	80	73	253	
	230-3-60	17.6	136	27				2.3	8.2	1		None	-	-	-	32.5	35	50	32	220	33.5	35	50	33	222	
												10625	6.5	1	15.6	52	60	60	50	236	53	60	60	51	238	
												11125	10.5	1	25.3	64.1	70	70	61	245	65.1	70	70	63	248	
												11625	16	1	38.5	80.6	90	90	77	259	81.6	90	90	78	261	
	460-3-60	8.5	66.1	13				1.3	4.1	0.5		None	-	-	-	16	20	20	16	104	16.5	20	20	17	105	
												10646	6	1	7.2	25	25	30	24	111	25.5	30	30	25	112	
												11146	11.5	1	13.8	33.3	35	35	32	117	33.8	35	35	32	118	
												11446	14	1	16.8	37	40	40	35	120	37.5	40	40	36	121	
	575-3-60	6.3	55.3	10				1.1	3.2	0.4		None	-	-	-	12.2	15	15	12	84	12.6	15	15	13	85	
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7	1.1		None	-	-	-	42.7	45	50	45	236	44.9	45	50	48	241	
												11725	12	1	33.3	84.3	90	90	83	269	86.5	90	90	86	274	
												12525	18.6	1	51.6	107.2	110	110	104	288	109.4	110	110	107	293	
												13225	24	1	66.6	126	150	150	122	303	128.2	150	150	124	308	
												14225	31.8	2	88.3	119.1	125	125	113	295	121.9	125	125	116	300	
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7.2	1		None	-	-	-	42.9	45	50	45	238	44.9	45	50	48	243	
												11725	16	1	38.5	91	100	100	90	277	93	100	100	92	281	
												12525	24.8	1	59.7	117.5	125	125	114	298	119.5	125	125	116	302	
												13225	32	1	77	139.2	150	150	134	315	141.2	150	150	136	320	
												14225	42.4	2	102	136.5	150	150	124	306	139	150	150	126	311	
	460-3-60	6.2	41	10	6.2	41	10	1.3	3.6	0.5		None	-	-	-	20.2	25	25	21	119	21.2	25	25	23	121	
												11746	16.5	1	19.8	45	45	45	44	139	46	50	50	45	141	
												12846	27.8	1	33.4	62	70	70	60	152	63	70	70	61	154	
												13346	33	1	39.7	69.8	70	70	67	158	70.8	80	80	68	161	
												14246	41.7	2	50.2	67.3	70	70	60	152	68.5	70	70	61	154	
575-3-60	4.9	33	8	4.9	33	8	1.1	2.5	0.4		None	-	-	-	15.7	20	20	17	88	16.5	20	20	18	90		
											11758	17	1	16.4	36.2	40	40	36	105	37	40	40	36	107		
											13458	34	1	32.7	56.6	60	60	54	121	57.4	60	60	55	123		

XXEA7-12 Medium Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	7	1.1		None	-	-	-	44.2	45	50	47	266	46.4	50	50	49	271
												11725	12	1	33.3	85.8	90	90	85	299	88	90	90	88	304
												12525	18.6	1	51.6	108.7	110	110	106	317	110.9	125	125	109	322
												13225	24	1	66.6	127.5	150	150	123	332	129.7	150	150	126	337
												14225	31.8	2	88.3	119.1	125	125	115	325	121.9	125	125	117	330
	230-3-60	14.5	98	23	14.5	98	23	2.3	7.2	1		None	-	-	-	44.4	45	50	47	268	46.4	50	60	49	272
												11725	16	1	38.5	92.5	100	100	91	306	94.5	100	100	93	311
												12525	24.8	1	59.7	119	125	125	116	328	121	125	125	118	332
												13225	32	1	77	140.7	150	150	135	345	142.7	150	150	138	349
												14225	42.4	2	102	136.5	150	150	125	336	139	150	150	128	341
	460-3-60	6.3	55	10	6.3	55	10	1.3	3.6	0.5		None	-	-	-	20.4	25	25	22	147	21.4	25	25	23	149
												11746	16.5	1	19.8	45.2	50	50	44	167	46.2	50	50	46	169
												12846	27.8	1	33.4	62.2	70	70	60	180	63.2	70	70	61	182
												13346	33	1	39.7	70	70	70	67	186	71	80	80	68	189
												14246	41.7	2	50.2	67.3	70	70	60	180	68.5	70	70	61	182
	575-3-60	6	41	9	6	41	9	1.1	2.5	0.4		None	-	-	-	18.2	20	20	19	104	19	20	20	20	106
												11758	17	1	16.4	38.7	40	40	38	121	39.5	40	40	39	123
												13458	34	1	32.7	59.1	60	60	57	137	59.9	60	60	58	139
												None	-	-	-	51.3	60	60	54	315	53.5	60	60	57	320
												11725	12	1	33.3	92.9	100	100	93	348	95.1	100	100	95	353
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	9.9	1.1		12525	18.6	1	51.6	115.8	125	125	114	366	118	125	125	116	371
												13225	24	1	66.6	134.6	150	150	131	381	136.8	150	150	134	386
												14225	31.8	2	88.3	125.2	150	150	122	374	127.4	150	150	125	379
												None	-	-	-	50.2	60	60	53	320	52.2	60	60	55	324
												11725	16	1	38.5	98.3	100	100	97	358	100.3	110	110	100	363
	230-3-60	15.6	110	24	16	110	25	5.2	9.4	1		12525	24.8	1	59.7	124.8	125	125	122	379	126.8	150	150	124	384
												13225	32	1	77	146.5	150	150	142	397	148.5	150	150	144	401
												14225	42.4	2	102	139.3	150	150	131	388	141.8	150	150	134	392
												None	-	-	-	25.2	30	30	27	155	26.2	30	30	28	158
												11746	16.5	1	19.8	50	50	50	49	175	51	60	60	51	177
	460-3-60	7.8	52	12	7.8	52	12	2.9	4.7	0.5		12846	27.8	1	33.4	67	70	70	65	189	68	70	70	66	191
												13346	33	1	39.7	74.8	80	80	72	195	75.8	80	80	73	197
												14246	41.7	2	50.2	68.6	70	70	65	189	69.9	70	70	66	191
												None	-	-	-	19.5	20	25	21	129	20.3	25	25	22	131
												11758	17	1	16.4	40	40	40	40	146	40.8	45	45	40	147
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	4.3	0.4		13458	34	1	32.7	60.4	70	70	58	162	61.2	70	70	59	164

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.
4. Non-fused Disconnect, Verify on the unit nameplate that the disconnect is properly sized for the application. Units with field installed electric heat kits may exceed the factory installed disconnect amperage rating.

XXEA7-12 Medium Indoor Blower - With Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
A7 (6)	208-3-60	17.6	136	27				2.3	7.5	1.1	8.6	None	-	-	-	36.1	40	50	36	194	37.2	40	50	38	196
												10625	4.9	1	13.6	53.1	60	60	52	207	54.2	60	60	53	210
												11125	7.9	1	21.9	63.5	70	70	62	216	64.6	70	70	63	218
												11625	12	1	33.3	77.7	80	80	75	227	78.8	80	80	76	230
	230-3-60	17.6	136	27				2.3	7.5	1	8.6	None	-	-	-	36.1	40	50	36	200	37.1	40	50	38	203
												10625	6.5	1	15.6	55.6	60	60	54	216	56.6	60	70	56	218
												11125	10.5	1	25.3	67.7	70	70	66	226	68.7	70	80	67	228
												11625	16	1	38.5	84.2	90	90	81	239	85.2	90	90	82	241
	460-3-60	8.5	66.1	13				1.3	3.4	0.5	8.6	None	-	-	-	17.5	20	25	18	99	18	20	25	18	100
												10646	6	1	7.2	26.5	30	30	26	106	27	30	30	27	107
												11146	11.5	1	13.8	34.8	35	35	34	112	35.3	40	40	34	114
												11446	14	1	16.8	38.5	40	40	37	115	39	40	40	38	117
	575-3-60	6.3	55.3	10				1.1	2.8	0.4	8.6	None	-	-	-	13.5	15	15	14	81	13.9	15	15	14	82
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	5.2	1.1	8.6	None	-	-	-	45.2	50	50	48	203	47.4	50	60	50	208
												11725	12	1	33.3	86.8	90	90	86	236	89	90	90	89	241
												12525	18.6	1	51.6	109.7	110	110	107	254	111.9	125	125	110	259
												13225	24	1	66.6	128.5	150	150	125	269	130.7	150	150	127	274
												14225	31.8	2	88.3	122.3	125	125	116	262	125	150	150	118	267
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	5.2	1	8.6	None	-	-	-	45.2	50	50	48	206	47.2	50	60	50	210
												11725	16	1	38.5	93.3	100	100	92	244	95.3	100	100	95	249
												12525	24.8	1	59.7	119.8	125	125	117	265	121.8	125	125	119	270
												13225	32	1	77	141.5	150	150	137	283	143.5	150	150	139	287
												14225	42.4	2	102	139.4	150	150	126	274	141.9	150	150	129	278
	460-3-60	6.2	41	10	6.2	41	10	1.3	2.6	0.5	8.6	None	-	-	-	21.4	25	25	23	102	22.4	25	25	24	105
												11746	16.5	1	19.8	46.2	50	50	46	122	47.2	50	50	47	124
												12846	27.8	1	33.4	63.2	70	70	61	136	64.2	70	70	62	138
												13346	33	1	39.7	71	80	80	68	142	72	80	80	70	144
												14246	41.7	2	50.2	68.7	70	70	61	136	69.9	70	70	62	138
	575-3-60	4.9	33	8	4.9	33	8	1.1	2	0.4	8.6	None	-	-	-	16.9	20	20	18	82	17.7	20	20	19	84
												11758	17	1	16.4	37.4	40	40	37	99	38.2	40	40	38	101
												13458	34	1	32.7	57.8	60	60	56	115	58.6	60	60	57	117
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1.1	8.6	None	-	-	-	46.7	50	60	50	232	48.9	50	60	52	237
												11725	12	1	33.3	88.3	90	90	88	266	90.5	100	100	90	271
												12525	18.6	1	51.6	111.2	125	125	109	284	113.4	125	125	111	289
												13225	24	1	66.6	130	150	150	126	299	132.2	150	150	129	304
												14225	31.8	2	88.3	122.3	125	125	118	291	125	150	150	120	296
	230-3-60	14.5	98	23	14.5	98	23	2.3	5.2	1	8.6	None	-	-	-	46.7	50	60	50	235	48.7	50	60	52	240
												11725	16	1	38.5	94.8	100	100	94	274	96.8	100	100	96	278
												12525	24.8	1	59.7	121.3	125	125	118	295	123.3	125	125	121	300
												13225	32	1	77	143	150	150	138	312	145	150	150	140	317
												14225	42.4	2	102	139.4	150	150	128	303	141.9	150	150	130	308
	460-3-60	6.3	55	10	6.3	55	10	1.3	2.6	0.5	8.6	None	-	-	-	21.6	25	25	23	130	22.6	25	25	24	133
												11746	16.5	1	19.8	46.4	50	50	46	150	47.4	50	50	47	152
												12846	27.8	1	33.4	63.4	70	70	61	164	64.4	70	70	63	166
												13346	33	1	39.7	71.2	80	80	69	170	72.2	80	80	70	172
												14246	41.7	2	50.2	68.7	70	70	61	164	69.9	70	70	63	166
	575-3-60	6	41	9	6	41	9	1.1	2	0.4	8.6	None	-	-	-	19.4	20	25	21	98	20.2	25	25	22	100
11758												17	1	16.4	39.9	40	40	39	115	40.7	45	45	40	117	
13458												34	1	32.7	60.3	70	70	58	131	61.1	70	70	59	133	

XXEA7-12 Medium Indoor Blower - With Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ^{2/} Breaker ³ Size (Amps)	Max Fuse ^{2/} Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ w/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	10.2	1.1	8.6	None	-	-	-	55.9	60	70	60	310	58.1	60	70	62	315
												11725	12	1	33.3	97.5	100	100	98	343	99.7	100	100	101	348
												12525	18.6	1	51.6	120.4	125	125	119	361	122.6	125	125	122	366
												13225	24	1	66.6	139.2	150	150	136	376	141.4	150	150	139	381
	230-3-60	15.6	110	24	16	110	25	5.2	10.2	1	8.6	None	-	-	-	55.3	60	70	59	312	57.3	60	70	61	317
												11725	16	1	38.5	103.4	110	110	103	351	105.4	110	110	106	355
												12525	24.8	1	59.7	129.9	150	150	128	372	131.9	150	150	130	377
												13225	32	1	77	151.6	175	175	148	389	153.6	175	175	150	394
	460-3-60	7.8	52	12	7.8	52	12	2.9	4.8	0.5	8.6	None	-	-	-	27.5	30	35	29	152	28.5	30	35	30	154
												11746	16.5	1	19.8	52.3	60	60	52	171	53.3	60	60	53	174
												12846	27.8	1	33.4	69.3	70	70	68	185	70.3	80	80	69	187
												13346	33	1	39.7	77.1	80	80	75	191	78.1	80	80	76	194
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	3.4	0.4	8.6	None	-	-	-	20.3	25	25	22	118	21.1	25	25	23	120
												11758	17	1	16.4	40.8	45	45	40	135	41.6	45	45	41	137
												13458	34	1	32.7	61.2	70	70	59	151	62	70	70	60	153
												With VFD													
A7 (6)	208-3-60	17.6	136	27				2.3	8.9	1.1	8.6	None	-	-	-	37.5	40	50	38	222	38.6	40	50	39	224
												10625	4.9	1	13.6	54.5	60	60	54	236	55.6	60	60	55	238
												11125	7.9	1	21.9	64.9	70	70	63	244	66	70	70	65	246
												11625	12	1	33.3	79.1	80	80	76	255	80.2	90	90	78	258
	230-3-60	17.6	136	27				2.3	8.2	1	8.6	None	-	-	-	36.8	40	50	37	224	37.8	40	50	38	227
												10625	6.5	1	15.6	56.3	60	70	55	240	57.3	60	70	56	242
												11125	10.5	1	25.3	68.4	70	70	66	250	69.4	70	80	68	252
												11625	16	1	38.5	84.9	90	90	82	263	85.9	90	90	83	265
	460-3-60	8.5	66.1	13				1.3	4.1	0.5	8.6	None	-	-	-	18.2	20	25	19	106	18.7	20	25	19	107
												10646	6	1	7.2	27.2	30	30	27	113	27.7	30	30	27	114
												11146	11.5	1	13.8	35.5	40	40	34	119	36	40	40	35	121
												11446	14	1	16.8	39.2	40	40	38	122	39.7	40	40	38	124
	575-3-60	6.3	55.3	10				1.1	3.2	0.4	8.6	None	-	-	-	13.9	15	20	14	85	14.3	15	20	15	86
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7	1.1	8.6	None	-	-	-	47	50	60	50	240	49.2	50	60	53	245
												11725	12	1	33.3	88.6	90	90	88	274	90.8	100	100	91	279
												12525	18.6	1	51.6	111.5	125	125	109	292	113.7	125	125	112	297
												13225	24	1	66.6	130.3	150	150	127	307	132.5	150	150	129	312
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	7.2	1	8.6	None	-	-	-	47.2	50	60	50	242	49.2	50	60	53	247
												11725	16	1	38.5	95.3	100	100	95	281	97.3	100	100	97	285
												12525	24.8	1	59.7	121.8	125	125	119	302	123.8	125	125	121	307
												13225	32	1	77	143.5	150	150	139	319	145.5	150	150	141	324
	460-3-60	6.2	41	10	6.2	41	10	1.3	3.6	0.5	8.6	None	-	-	-	22.4	25	25	24	121	23.4	25	25	25	123
												11746	16.5	1	19.8	47.2	50	50	47	141	48.2	50	50	48	143
												12846	27.8	1	33.4	64.2	70	70	62	154	65.2	70	70	63	156
												13346	33	1	39.7	72	80	80	70	161	73	80	80	71	163
	575-3-60	4.9	33	8	4.9	33	8	1.1	2.5	0.4	8.6	None	-	-	-	17.4	20	20	19	90	18.2	20	20	20	92
												11758	17	1	16.4	37.9	40	40	37	107	38.7	40	40	38	108
												13458	34	1	32.7	58.3	60	60	56	123	59.1	60	60	57	125

XXEA7-12 Medium Indoor Blower - With Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ^{2/} Breaker ³ Size (Amps)	Max Fuse ^{2/} Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ w/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	7	1.1	8.6	None	-	-	-	48.5	50	60	52	270	50.7	60	60	54	275
												11725	12	1	33.3	90.1	100	100	90	303	92.3	100	100	92	308
												12525	18.6	1	51.6	113	125	125	111	322	115.2	125	125	114	327
												13225	24	1	66.6	131.8	150	150	128	337	134	150	150	131	342
												14225	31.8	2	88.3	124.5	125	125	120	329	127.3	150	150	122	334
	230-3-60	14.5	98	23	14.5	98	23	2.3	7.2	1	8.6	None	-	-	-	48.7	50	60	52	272	50.7	60	60	54	277
												11725	16	1	38.5	96.8	100	100	96	311	98.8	100	100	98	315
												12525	24.8	1	59.7	123.3	125	125	121	332	125.3	150	150	123	336
												13225	32	1	77	145	150	150	140	349	147	150	150	143	354
												14225	42.4	2	102	141.9	150	150	130	340	144.4	150	150	132	345
	460-3-60	6.3	55	10	6.3	55	10	1.3	3.6	0.5	8.6	None	-	-	-	22.6	25	25	24	149	23.6	25	25	25	151
												11746	16.5	1	19.8	47.4	50	50	47	169	48.4	50	50	48	171
												12846	27.8	1	33.4	64.4	70	70	63	182	65.4	70	70	64	184
												13346	33	1	39.7	72.2	80	80	70	189	73.2	80	80	71	191
												14246	41.7	2	50.2	69.9	70	70	63	182	71.2	80	80	64	184
	575-3-60	6	41	9	6	41	9	1.1	2.5	0.4	8.6	None	-	-	-	19.9	20	25	21	106	20.7	25	25	22	108
												11758	17	1	16.4	40.4	45	45	40	123	41.2	45	45	41	124
												13458	34	1	32.7	60.8	70	70	59	139	61.6	70	70	60	141
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	9.9	1.1	8.6	None	-	-	-	55.6	60	70	59	319	57.8	60	70	62	324
												11725	12	1	33.3	97.2	100	100	98	352	99.4	100	100	100	357
												12525	18.6	1	51.6	120.1	125	125	119	370	122.3	125	125	121	375
												13225	24	1	66.6	138.9	150	150	136	385	141.1	150	150	138	390
												14225	31.8	2	88.3	129.5	150	150	127	378	131.7	150	150	130	383
	230-3-60	15.6	110	24	16	110	25	5.2	9.4	1	8.6	None	-	-	-	54.5	60	70	58	324	56.5	60	70	60	329
												11725	16	1	38.5	102.6	110	110	102	362	104.6	110	110	105	367
												12525	24.8	1	59.7	129.1	150	150	127	384	131.1	150	150	129	388
												13225	32	1	77	150.8	175	175	147	401	152.8	175	175	149	406
												14225	42.4	2	102	144.6	150	150	136	392	147.1	150	150	139	397
	460-3-60	7.8	52	12	7.8	52	12	2.9	4.7	0.5	8.6	None	-	-	-	27.4	30	35	29	157	28.4	30	35	30	160
												11746	16.5	1	19.8	52.2	60	60	52	177	53.2	60	60	53	179
												12846	27.8	1	33.4	69.2	70	70	68	191	70.2	80	80	69	193
												13346	33	1	39.7	77	80	80	75	197	78	80	80	76	199
												14246	41.7	2	50.2	71.3	80	80	68	191	72.6	80	80	69	193
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	4.3	0.4	8.6	None	-	-	-	21.2	25	25	23	131	22	25	25	24	133
												11758	17	1	16.4	41.7	45	45	42	147	42.5	45	45	42	149
												13458	34	1	32.7	62.1	70	70	60	164	62.9	70	70	61	165

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.
4. Non-fused Disconnect, Verify on the unit nameplate that the disconnect is properly sized for the application. Units with field installed electric heat kits may exceed the factory installed disconnect amperage rating.

XXEA7-12 High Indoor Blower - Without Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh		
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA	
A7 (6)	208-3-60	17.6	136	27				2.3	10.2	1.1		None	-	-	-	34.5	35	50	35	204	35.6	40	50	36	207	
												10625	4.9	1	13.6	51.5	60	60	50	218	52.6	60	60	52	220	
												11125	7.9	1	21.9	61.9	70	70	60	226	63	70	70	61	228	
												11625	12	1	33.3	76.1	80	80	73	237	77.2	80	80	74	240	
	230-3-60	17.6	136	27				2.3	10.2	1		None	-	-	-	34.5	35	50	35	210	35.5	40	50	36	212	
												10625	6.5	1	15.6	54	60	60	53	226	55	60	60	54	228	
												11125	10.5	1	25.3	66.1	70	70	64	235	67.1	70	70	65	238	
												11625	16	1	38.5	82.6	90	90	79	249	83.6	90	90	80	251	
	460-3-60	8.5	66.1	13				1.3	4.8	0.5		None	-	-	-	16.7	20	25	17	104	17.2	20	25	17	105	
												10646	6	1	7.2	25.7	30	30	25	111	26.2	30	30	26	112	
												11146	11.5	1	13.8	34	35	33	117	34.5	35	35	33	118		
												11446	14	1	16.8	37.7	40	40	36	120	38.2	40	40	37	121	
	575-3-60	6.3	55.3	10				1.1	3.4	0.4		None	-	-	-	12.4	15	15	12	85	12.8	15	15	13	86	
	08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	10.2	1.1		None	-	-	-	45.9	50	50	49	239	48.1	50	60	51	244
													11725	12	1	33.3	87.5	90	90	87	272	89.7	90	90	90	277
													12525	18.6	1	51.6	110.4	125	125	108	291	112.6	125	125	111	296
13225													24	1	66.6	129.2	150	150	125	306	131.4	150	150	128	311	
14225													31.8	2	88.3	123.1	125	125	117	298	125.9	150	150	119	303	
230-3-60		13.8	83.1	22	13.8	83.1	22	2.3	10.2	1		None	-	-	-	45.9	50	50	49	245	47.9	50	60	51	250	
												11725	16	1	38.5	94	100	100	93	284	96	100	100	95	288	
												12525	24.8	1	59.7	120.5	125	125	117	305	122.5	125	125	120	310	
												13225	32	1	77	142.2	150	150	137	322	144.2	150	150	140	327	
												14225	42.4	2	102	140.3	150	150	127	313	142.8	150	150	129	318	
460-3-60		6.2	41	10	6.2	41	10	1.3	4.8	0.5		None	-	-	-	21.4	25	25	23	122	22.4	25	25	24	125	
												11746	16.5	1	19.8	46.2	50	50	46	142	47.2	50	50	47	144	
												12846	27.8	1	33.4	63.2	70	70	61	156	64.2	70	70	62	158	
												13346	33	1	39.7	71	80	80	68	162	72	80	80	70	164	
												14246	41.7	2	50.2	68.8	70	70	61	156	70	70	70	62	158	
575-3-60		4.9	33	8	4.9	33	8	1.1	3.4	0.4		None	-	-	-	16.6	20	20	18	98	17.4	20	20	19	100	
	11758											17	1	16.4	37.1	40	40	37	115	37.9	40	40	37	117		
	13458											34	1	32.7	57.5	60	60	55	131	58.3	60	60	56	133		
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	10.2	1.1		None	-	-	-	47.4	50	60	50	269	49.6	50	60	53	274	
												11725	12	1	33.3	89	90	90	89	302	91.2	100	100	91	307	
												12525	18.6	1	51.6	111.9	125	125	110	320	114.1	125	125	112	325	
												13225	24	1	66.6	130.7	150	150	127	335	132.9	150	150	129	340	
												14225	31.8	2	88.3	123.1	125	125	118	328	125.9	150	150	121	333	
	230-3-60	14.5	98	23	14.5	98	23	2.3	10.2	1		None	-	-	-	47.4	50	60	50	275	49.4	50	60	53	280	
												11725	16	1	38.5	95.5	100	100	95	314	97.5	100	100	97	318	
												12525	24.8	1	59.7	122	125	125	119	335	124	125	125	121	339	
												13225	32	1	77	143.7	150	150	139	352	145.7	150	150	141	357	
												14225	42.4	2	102	140.3	150	150	129	343	142.8	150	150	131	348	
	460-3-60	6.3	55	10	6.3	55	10	1.3	4.8	0.5		None	-	-	-	21.6	25	25	23	150	22.6	25	25	24	153	
												11746	16.5	1	19.8	46.4	50	50	46	170	47.4	50	50	47	172	
												12846	27.8	1	33.4	63.4	70	70	61	184	64.4	70	70	63	186	
												13346	33	1	39.7	71.2	80	80	69	190	72.2	80	80	70	192	
												14246	41.7	2	50.2	68.8	70	70	61	184	70	70	70	63	186	
	575-3-60	6	41	9	6	41	9	1.1	3.4	0.4		None	-	-	-	19.1	20	25	20	114	19.9	20	25	21	116	
11758												17	1	16.4	39.6	40	40	39	131	40.4	45	45	40	133		
13458												34	1	32.7	60	60	60	58	147	60.8	70	70	59	149		

XXEA7-12 High Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ^{2/} Breaker ³ Size (Amps)	Max Fuse ^{2/} Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ^{2/} Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ^{4/} Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
12 (10)	208-3-60											None	-	-	-	56.3	60	70	60	323	58.5	60	70	63	328
												11725	12	1	33.3	97.9	100	100	98	357	100.1	110	110	101	362
												12525	18.6	1	51.6	120.8	125	125	119	375	123	125	125	122	380
												13225	24	1	66.6	139.6	150	150	137	390	141.8	150	150	139	395
												14225	31.8	2	88.3	130.2	150	150	128	382	132.4	150	150	131	387
	230-3-60											None	-	-	-	55.8	60	70	60	322	57.8	60	70	62	327
												11725	16	1	38.5	103.9	110	110	104	361	105.9	110	110	106	365
												12525	24.8	1	59.7	130.4	150	150	128	382	132.4	150	150	131	386
												13225	32	1	77	152.1	175	175	148	399	154.1	175	175	150	404
												14225	42.4	2	102	146.3	150	150	138	390	148.8	150	150	140	395
	460-3-60											None	-	-	-	28	30	35	30	159	29	30	35	31	161
												11746	16.5	1	19.8	52.8	60	60	53	179	53.8	60	60	54	181
												12846	27.8	1	33.4	69.8	70	70	68	192	70.8	80	80	69	195
												13346	33	1	39.7	77.6	80	80	76	199	78.6	80	80	77	201
												14246	41.7	2	50.2	72.1	80	80	68	192	73.4	80	80	69	195
	575-3-60											None	-	-	-	20.8	25	25	22	124	21.6	25	25	23	126
												11758	17	1	16.4	41.3	45	45	41	141	42.1	45	45	42	143
												13458	34	1	32.7	61.7	70	70	60	157	62.5	70	70	61	159
	With VFD																								
	A7 (6)	208-3-60											None	-	-	-	34.2	35	50	34	213	35.3	40	50	36
												10625	4.9	1	13.6	51.2	60	60	50	227	52.3	60	60	51	229
												11125	7.9	1	21.9	61.6	70	70	59	235	62.7	70	70	61	238
												11625	12	1	33.3	75.8	80	80	73	247	76.9	80	80	74	249
230-3-60												None	-	-	-	33.7	35	50	34	222	34.7	35	50	35	224
												10625	6.5	1	15.6	53.2	60	60	52	237	54.2	60	60	53	240
												11125	10.5	1	25.3	65.3	70	70	63	247	66.3	70	70	64	249
												11625	16	1	38.5	81.8	90	90	78	260	82.8	90	90	79	262
460-3-60												None	-	-	-	16.6	20	25	17	109	17.1	20	25	17	110
												10646	6	1	7.2	25.6	30	30	25	117	26.1	30	30	26	118
												11146	11.5	1	13.8	33.9	35	35	33	123	34.4	35	35	33	124
575-3-60												11446	14	1	16.8	37.6	40	40	36	126	38.1	40	40	37	127
												None	-	-	-	13.3	15	15	13	98	13.7	15	15	14	99
08 (7.5)	208-3-60											None	-	-	-	45.6	50	50	48	248	47.8	50	60	51	253
												11725	12	1	33.3	87.2	90	90	87	282	89.4	90	90	89	287
												12525	18.6	1	51.6	110.1	125	125	108	300	112.3	125	125	110	305
												13225	24	1	66.6	128.9	150	150	125	315	131.1	150	150	128	320
												14225	31.8	2	88.3	122.8	125	125	116	307	125.5	150	150	119	312
	230-3-60											None	-	-	-	45.1	50	50	48	257	47.1	50	60	50	261
												11725	16	1	38.5	93.2	100	100	92	295	95.2	100	100	94	300
												12525	24.8	1	59.7	119.7	125	125	116	317	121.7	125	125	119	321
												13225	32	1	77	141.4	150	150	136	334	143.4	150	150	139	338
												14225	42.4	2	102	139.3	150	150	126	325	141.8	150	150	128	330
	460-3-60											None	-	-	-	21.3	25	25	23	128	22.3	25	25	24	130
												11746	16.5	1	19.8	46.1	50	50	45	148	47.1	50	50	47	150
												12846	27.8	1	33.4	63.1	70	70	61	162	64.1	70	70	62	164
												13346	33	1	39.7	70.9	80	80	68	168	71.9	80	80	69	170
												14246	41.7	2	50.2	68.6	70	70	61	162	69.9	70	70	62	164
	575-3-60											None	-	-	-	17.5	20	20	19	111	18.3	20	20	20	113
												11758	17	1	16.4	38	40	40	38	127	38.8	40	40	39	129
												13458	34	1	32.7	58.4	60	60	56	143	59.2	60	60	57	145

XXEA7-12 High Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	9.9	1.1		None	-	-	-	47.1	50	60	50	278	49.3	50	60	53	283
												11725	12	1	33.3	88.7	90	90	88	311	90.9	100	100	91	316
												12525	18.6	1	51.6	111.6	125	125	109	330	113.8	125	125	112	335
												13225	24	1	66.6	130.4	150	150	127	345	132.6	150	150	129	350
												14225	31.8	2	88.3	122.8	125	125	118	337	125.5	150	150	121	342
	230-3-60	14.5	98	23	14.5	98	23	2.3	9.4	1		None	-	-	-	46.6	50	60	49	287	48.6	50	60	52	291
												11725	16	1	38.5	94.7	100	100	94	325	96.7	100	100	96	330
												12525	24.8	1	59.7	121.2	125	125	118	346	123.2	125	125	120	351
												13225	32	1	77	142.9	150	150	138	364	144.9	150	150	140	368
												14225	42.4	2	102	139.3	150	150	128	355	141.8	150	150	130	359
	460-3-60	6.3	55	10	6.3	55	10	1.3	4.7	0.5		None	-	-	-	21.5	25	25	23	156	22.5	25	25	24	158
												11746	16.5	1	19.8	46.3	50	50	46	176	47.3	50	50	47	178
												12846	27.8	1	33.4	63.3	70	70	61	190	64.3	70	70	62	192
												13346	33	1	39.7	71.1	80	80	69	196	72.1	80	80	70	198
												14246	41.7	2	50.2	68.6	70	70	61	190	69.9	70	70	62	192
	575-3-60	6	41	9	6	41	9	1.1	4.3	0.4		None	-	-	-	20	25	25	21	127	20.8	25	25	22	129
												11758	17	1	16.4	40.5	45	45	40	143	41.3	45	45	41	145
												13458	34	1	32.7	60.9	70	70	59	159	61.7	70	70	60	161
												None	-	-	-	54.9	60	70	59	345	57.1	60	70	61	350
												11725	12	1	33.3	96.5	100	100	97	378	98.7	100	100	99	383
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	13.5	1.1		None	-	-	-	54.9	60	70	59	345	57.1	60	70	61	350
												11725	12	1	33.3	96.5	100	100	97	378	98.7	100	100	99	383
												12525	18.6	1	51.6	119.4	125	125	118	396	121.6	125	125	120	401
												13225	24	1	66.6	138.2	150	150	135	411	140.4	150	150	138	416
												14225	31.8	2	88.3	128.8	150	150	127	404	131	150	150	129	409
	230-3-60	15.6	110	24	16	110	25	5.2	13.4	1		None	-	-	-	54.2	60	70	58	341	56.2	60	70	60	346
												11725	16	1	38.5	102.3	110	110	102	380	104.3	110	110	104	384
												12525	24.8	1	59.7	128.8	150	150	126	401	130.8	150	150	129	405
												13225	32	1	77	150.5	175	175	146	418	152.5	175	175	149	423
												14225	42.4	2	102	144.3	150	150	136	409	146.8	150	150	138	414
	460-3-60	7.8	52	12	7.8	52	12	2.9	6.7	0.5		None	-	-	-	27.2	30	30	29	166	28.2	30	30	30	168
												11746	16.5	1	19.8	52	60	60	52	186	53	60	60	53	188
												12846	27.8	1	33.4	69	70	70	67	199	70	70	70	69	202
												13346	33	1	39.7	76.8	80	80	75	206	77.8	80	80	76	208
												14246	41.7	2	50.2	71.1	80	80	67	199	72.4	80	80	69	202
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	5.4	0.4		None	-	-	-	20.6	25	25	22	129	21.4	25	25	23	131
												11758	17	1	16.4	41.1	45	45	41	146	41.9	45	45	42	147
												13458	34	1	32.7	61.5	70	70	60	162	62.3	70	70	60	164

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.
4. Non-fused Disconnect, Verify on the unit nameplate that the disconnect is properly sized for the application. Units with field installed electric heat kits may exceed the factory installed disconnect amperage rating.

XXEA7-12 High Indoor Blower - With Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
A7 (6)	208-3-60	17.6	136	27				2.3	10.2	1.1	8.6	None	-	-	-	38.8	40	50	40	208	39.9	40	50	41	211
												10625	4.9	1	13.6	55.8	60	70	55	222	56.9	60	70	56	224
												11125	7.9	1	21.9	66.2	70	70	65	230	67.3	70	70	66	233
												11625	12	1	33.3	80.4	90	90	78	242	81.5	90	90	79	244
	230-3-60	17.6	136	27				2.3	10.2	1	8.6	None	-	-	-	38.8	40	50	40	214	39.8	40	50	41	217
												10625	6.5	1	15.6	58.3	60	70	58	230	59.3	60	70	59	232
												11125	10.5	1	25.3	70.4	80	80	69	240	71.4	80	80	70	242
												11625	16	1	38.5	86.9	90	90	84	253	87.9	90	90	85	255
	460-3-60	8.5	66.1	13				1.3	4.8	0.5	8.6	None	-	-	-	18.9	20	25	19	106	19.4	20	25	20	107
												10646	6	1	7.2	27.9	30	30	28	113	28.4	30	30	28	114
												11146	11.5	1	13.8	36.2	40	40	35	119	36.7	40	40	36	121
												11446	14	1	16.8	39.9	40	40	39	122	40.4	45	45	39	124
	575-3-60	6.3	55.3	10				1.1	3.4	0.4	8.6	None	-	-	-	14.1	15	20	14	87	14.5	15	20	15	88
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	10.2	1.1	8.6	None	-	-	-	50.2	60	60	54	243	52.4	60	60	56	248
												11725	12	1	33.3	91.8	100	100	92	277	94	100	100	95	282
												12525	18.6	1	51.6	114.7	125	125	113	295	116.9	125	125	116	300
												13225	24	1	66.6	133.5	150	150	130	310	135.7	150	150	133	315
												14225	31.8	2	88.3	128.5	150	150	122	302	131.3	150	150	124	307
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	10.2	1	8.6	None	-	-	-	50.2	60	60	54	250	52.2	60	60	56	254
												11725	16	1	38.5	98.3	100	100	98	288	100.3	110	110	100	293
												12525	24.8	1	59.7	124.8	125	125	122	309	126.8	150	150	125	314
												13225	32	1	77	146.5	150	150	142	327	148.5	150	150	145	331
												14225	42.4	2	102	145.6	150	150	132	318	148.1	150	150	134	322
	460-3-60	6.2	41	10	6.2	41	10	1.3	4.8	0.5	8.6	None	-	-	-	23.6	25	25	25	124	24.6	25	25	26	127
												11746	16.5	1	19.8	48.4	50	50	48	144	49.4	50	50	49	146
												12846	27.8	1	33.4	65.4	70	70	64	158	66.4	70	70	65	160
												13346	33	1	39.7	73.2	80	80	71	164	74.2	80	80	72	166
												14246	41.7	2	50.2	71.4	80	80	64	158	72.7	80	80	65	160
	575-3-60	4.9	33	8	4.9	33	8	1.1	3.4	0.4	8.6	None	-	-	-	18.3	20	20	20	100	19.1	20	20	21	102
11758												17	1	16.4	38.8	40	40	39	116	39.6	40	40	39	118	
13458												34	1	32.7	59.2	60	60	57	133	60	60	60	58	135	
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	10.2	1.1	8.6	None	-	-	-	51.7	60	60	55	273	53.9	60	60	58	278
												11725	12	1	33.3	93.3	100	100	94	306	95.5	100	100	96	311
												12525	18.6	1	51.6	116.2	125	125	115	325	118.4	125	125	117	330
												13225	24	1	66.6	135	150	150	132	340	137.2	150	150	134	345
												14225	31.8	2	88.3	128.5	150	150	123	332	131.3	150	150	126	337
	230-3-60	14.5	98	23	14.5	98	23	2.3	10.2	1	8.6	None	-	-	-	51.7	60	60	55	279	53.7	60	60	58	284
												11725	16	1	38.5	99.8	100	100	100	318	101.8	110	110	102	322
												12525	24.8	1	59.7	126.3	150	150	124	339	128.3	150	150	126	344
												13225	32	1	77	148	150	150	144	356	150	150	150	146	361
												14225	42.4	2	102	145.6	150	150	134	347	148.1	150	150	136	352
	460-3-60	6.3	55	10	6.3	55	10	1.3	4.8	0.5	8.6	None	-	-	-	23.8	25	30	26	152	24.8	25	30	27	155
												11746	16.5	1	19.8	48.6	50	50	48	172	49.6	50	50	49	174
												12846	27.8	1	33.4	65.6	70	70	64	186	66.6	70	70	65	188
												13346	33	1	39.7	73.4	80	80	71	192	74.4	80	80	72	194
												14246	41.7	2	50.2	71.4	80	80	64	186	72.7	80	80	65	188
	575-3-60	6	41	9	6	41	9	1.1	3.4	0.4	8.6	None	-	-	-	20.8	25	25	22	116	21.6	25	25	23	118
11758												17	1	16.4	41.3	45	45	41	132	42.1	45	45	42	134	
13458												34	1	32.7	61.7	70	70	60	149	62.5	70	70	61	151	

XXEA7-12 High Indoor Blower - With Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	14.9	1.1	8.6	None	-	-	-	60.6	70	70	65	328	62.8	70	70	68	333
												11725	12	1	33.3	102.2	110	110	103	361	104.4	110	110	106	366
												12525	18.6	1	51.6	125.1	150	150	124	379	127.3	150	150	127	384
												13225	24	1	66.6	143.9	150	150	142	394	146.1	150	150	144	399
												14225	31.8	2	88.3	134.5	150	150	133	387	137.1	150	150	136	392
	230-3-60	15.6	110	24	16	110	25	5.2	15	1	8.6	None	-	-	-	60.1	70	70	65	326	62.1	70	70	67	331
												11725	16	1	38.5	108.2	110	110	109	365	110.2	125	125	111	369
												12525	24.8	1	59.7	134.7	150	150	133	386	136.7	150	150	135	391
												13225	32	1	77	156.4	175	175	153	403	158.4	175	175	155	408
												14225	42.4	2	102	151.6	175	175	143	394	154.1	175	175	145	399
	460-3-60	7.8	52	12	7.8	52	12	2.9	7.5	0.5	8.6	None	-	-	-	30.2	35	35	32	161	31.2	35	35	34	163
												11746	16.5	1	19.8	55	60	60	55	181	56	60	60	56	183
												12846	27.8	1	33.4	72	80	80	71	195	73	80	80	72	197
												13346	33	1	39.7	79.8	80	80	78	201	80.8	90	90	79	203
												14246	41.7	2	50.2	74.8	80	80	71	195	76.1	80	80	72	197
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	5.6	0.4	8.6	None	-	-	-	22.5	25	25	24	126	23.3	25	25	25	128
												11758	17	1	16.4	43	45	45	43	142	43.8	45	45	44	144
												13458	34	1	32.7	63.4	70	70	62	159	64.2	70	70	63	161
	With VFD																								
	A7 (6)	208-3-60	17.6	136	27				2.3	9.9	1.1	8.6	None	-	-	-	38.5	40	50	39	218	39.6	40	50	40
10625													4.9	1	13.6	55.5	60	60	55	231	56.6	60	70	56	234
11125													7.9	1	21.9	65.9	70	70	64	240	67	70	70	66	242
11625													12	1	33.3	80.1	90	90	78	251	81.2	90	90	79	253
230-3-60		17.6	136	27				2.3	9.4	1	8.6	None	-	-	-	38	40	50	39	226	39	40	50	40	228
												10625	6.5	1	15.6	57.5	60	70	57	242	58.5	60	70	58	244
												11125	10.5	1	25.3	69.6	70	80	68	251	70.6	80	80	69	254
												11625	16	1	38.5	86.1	90	90	83	264	87.1	90	90	84	267
460-3-60		8.5	66.1	13				1.3	4.7	0.5	8.6	None	-	-	-	18.8	20	25	19	111	19.3	20	25	20	113
												10646	6	1	7.2	27.8	30	30	27	119	28.3	30	30	28	120
	11146											11.5	1	13.8	36.1	40	40	35	125	36.6	40	40	36	126	
	11446											14	1	16.8	39.8	40	40	39	128	40.3	45	45	39	129	
575-3-60	6.3	55.3	10				1.1	4.3	0.4	8.6	None	-	-	-	15	20	20	15	99	15.4	20	20	16	100	
08 (7.5)	208-3-60	13.8	83.1	22	13.8	83.1	22	2.3	9.9	1.1	8.6	None	-	-	-	49.9	50	60	53	253	52.1	60	60	56	258
												11725	12	1	33.3	91.5	100	100	92	286	93.7	100	100	94	291
												12525	18.6	1	51.6	114.4	125	125	113	304	116.6	125	125	115	309
												13225	24	1	66.6	133.2	150	150	130	319	135.4	150	150	132	324
												14225	31.8	2	88.3	128.1	150	150	121	312	130.9	150	150	124	317
	230-3-60	13.8	83.1	22	13.8	83.1	22	2.3	9.4	1	8.6	None	-	-	-	49.4	50	60	53	261	51.4	60	60	55	266
												11725	16	1	38.5	97.5	100	100	97	300	99.5	100	100	99	304
												12525	24.8	1	59.7	124	125	125	121	321	126	150	150	124	325
												13225	32	1	77	145.7	150	150	141	338	147.7	150	150	144	343
												14225	42.4	2	102	144.6	150	150	131	329	147.1	150	150	133	334
	460-3-60	6.2	41	10	6.2	41	10	1.3	4.7	0.5	8.6	None	-	-	-	23.5	25	25	25	130	24.5	25	25	26	132
												11746	16.5	1	19.8	48.3	50	50	48	150	49.3	50	50	49	152
												12846	27.8	1	33.4	65.3	70	70	64	164	66.3	70	70	65	166
												13346	33	1	39.7	73.1	80	80	71	170	74.1	80	80	72	172
												14246	41.7	2	50.2	71.3	80	80	64	164	72.6	80	80	65	166
	575-3-60	4.9	33	8	4.9	33	8	1.1	4.3	0.4	8.6	None	-	-	-	19.2	20	20	21	112	20	20	20	22	114
11758												17	1	16.4	39.7	40	40	40	129	40.5	45	45	40	131	
13458												34	1	32.7	60.1	70	70	58	145	60.9	70	70	59	147	

XXEA7-12 High Indoor Blower - With Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA ¹ (Amps)	Min Fuse ² / Breaker ³ Size (Amps)	Max Fuse ² / Breaker ³ Size (Amps)	Min Discon- nect Rating ⁴		MCA ¹ w/Pwr Exh (Amps)	Min Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Max Fuse ² / Breaker ³ Size w/ Pwr Exh (Amps)	Min Discon- nect Rating ⁴ / Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
09 (8.5)	208-3-60	14.5	98	23	14.5	98	23	2.3	9.9	1.1	8.6	None	-	-	-	51.4	60	60	55	282	53.6	60	60	58	287
												11725	12	1	33.3	93	100	100	93	316	95.2	100	100	96	321
												12525	18.6	1	51.6	115.9	125	125	114	334	118.1	125	125	117	339
												13225	24	1	66.6	134.7	150	150	132	349	136.9	150	150	134	354
												14225	31.8	2	88.3	128.1	150	150	123	342	130.9	150	150	125	347
	230-3-60	14.5	98	23	14.5	98	23	2.3	9.4	1	8.6	None	-	-	-	50.9	60	60	54	291	52.9	60	60	57	296
												11725	16	1	38.5	99	100	100	99	329	101	110	110	101	334
												12525	24.8	1	59.7	125.5	150	150	123	351	127.5	150	150	125	355
												13225	32	1	77	147.2	150	150	143	368	149.2	150	150	145	373
												14225	42.4	2	102	144.6	150	150	133	359	147.1	150	150	135	364
	460-3-60	6.3	55	10	6.3	55	10	1.3	4.7	0.5	8.6	None	-	-	-	23.7	25	25	25	158	24.7	25	25	27	160
												11746	16.5	1	19.8	48.5	50	50	48	178	49.5	50	50	49	180
												12846	27.8	1	33.4	65.5	70	70	64	192	66.5	70	70	65	194
												13346	33	1	39.7	73.3	80	80	71	198	74.3	80	80	72	200
												14246	41.7	2	50.2	71.3	80	80	64	192	72.6	80	80	65	194
	575-3-60	6	41	9	6	41	9	1.1	4.3	0.4	8.6	None	-	-	-	21.7	25	25	23	128	22.5	25	25	24	130
												11758	17	1	16.4	42.2	45	45	42	145	43	45	45	43	147
												13458	34	1	32.7	62.6	70	70	61	161	63.4	70	70	62	163
												None	-	-	-	59.2	60	70	63	349	61.4	70	70	66	354
												11725	12	1	33.3	100.8	110	110	102	382	103	110	110	104	387
12 (10)	208-3-60	15.6	110	24	16	110	25	5.8	13.5	1.1	8.6	None	-	-	-	59.2	60	70	63	349	61.4	70	70	66	354
												11725	12	1	33.3	100.8	110	110	102	382	103	110	110	104	387
												12525	18.6	1	51.6	123.7	125	125	123	401	125.9	150	150	125	406
												13225	24	1	66.6	142.5	150	150	140	416	144.7	150	150	143	421
												14225	31.8	2	88.3	133.1	150	150	131	408	135.4	150	150	134	413
	230-3-60	15.6	110	24	16	110	25	5.2	13.4	1	8.6	None	-	-	-	58.5	60	70	63	345	60.5	70	70	65	350
												11725	16	1	38.5	106.6	110	110	107	384	108.6	110	110	109	388
												12525	24.8	1	59.7	133.1	150	150	131	405	135.1	150	150	134	410
												13225	32	1	77	154.8	175	175	151	422	156.8	175	175	154	427
												14225	42.4	2	102	149.6	150	150	141	413	152.1	175	175	143	418
	460-3-60	7.8	52	12	7.8	52	12	2.9	6.7	0.5	8.6	None	-	-	-	29.4	30	35	32	168	30.4	35	35	33	170
												11746	16.5	1	19.8	54.2	60	60	54	188	55.2	60	60	55	190
												12846	27.8	1	33.4	71.2	80	80	70	202	72.2	80	80	71	204
												13346	33	1	39.7	79	80	80	77	208	80	80	80	78	210
												14246	41.7	2	50.2	73.8	80	80	70	202	75.1	80	80	71	204
	575-3-60	5.8	38.9	9	5.7	38.9	9	2.2	5.4	0.4	8.6	None	-	-	-	22.3	25	25	24	131	23.1	25	25	25	133
												11758	17	1	16.4	42.8	45	45	43	147	43.6	45	45	44	149
												13458	34	1	32.7	63.2	70	70	62	164	64	70	70	62	165

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.
4. Non-fused Disconnect, Verify on the unit nameplate that the disconnect is properly sized for the application. Units with field installed electric heat kits may exceed the factory installed disconnect amperage rating.

Table 9: Physical Data
XXA7, XX08-09, XX12

Component	Models			
	XXA7	XX08	XX09	XX12
Nominal Tonnage	6	7.5	8.5	10
AHRI COOLING PERFORMANCE				
Gross Capacity @ AHRI A point (Btu)	68,500	93,000	105,000	119,000
AHRI net capacity (MBH)	66,700	90,000	102,000	116,000
EER	11.0	11.5	11.8	11.0
SEER	-	-	-	-
IEER	12.7	13.3	13.1	-
IEER IntelliSpeed	14.8	15.1	14.4	13.4
Nominal CFM	2,000	3,300	3,400	3,830
System power (KW)	6.1	8.4	8.8	10.5
Refrigerant type	R410A	R410A	R410A	R410A
Refrigerant charge (lb-oz)				
System 1	15.75	12.00	14.00	13.50
System 2	-	12.00	14.00	13.50
ARI HEATING PERFORMANCE				
47°F capacity rating (MBH)	64,400	84,000	94,000	108,500
System power (KW) / COP	5.3 / 3.5	7.0 / 3.5	8.3 / 3.35	9.4 / 3.32
17°F capacity rating (MBH)	35,000	49,000	57,000	62,000
System power (KW) / COP	4.7 / 2.3	6.4 / 2.25	7.5 / 2.25	3.0 / 2.05
HSPF (Btu/Watts-hr)	-	-	-	-
DIMENSIONS (inches)				
Length	74.1	87.2	87.2	87.2
Width	48.9	61.7	61.7	61.7
Height	40.6	48.6	48.6	48.6
OPERATING WT. (lbs.)				
	652	976	1,025	1,060
COMPRESSORS				
Type	2-STAGE SCROLL	SCROLL	SCROLL	SCROLL
Quantity	1	2	2	2
Unit Capacity Steps (%)	67/100	50/100	50/100	50/100
CONDENSER COIL DATA				
Face area (Sq. Ft.)	19.4	25.6	25.6	25.6
Rows	2	2	3	3
Fins per inch	15	17	13	17
Tube diameter	0.375	0.375	0.375	0.375
Circuitry Type	Intertwined	Intertwined	Intertwined	Intertwined
Refrigerant control	TXV	TXV	TXV	TXV
EVAPORATOR COIL DATA				
Face area (Sq. Ft.)	7.3	11.1	11.1	11.1
Rows	4	4	4	4
Fins per inch	15	15	15	15
Tube diameter	0.375	0.375	0.375	0.375
Circuitry Type	Intertwined	Intertwined	Intertwined	Intertwined
Refrigerant control	TXV	TXV	TXV	TXV
CONDENSER FAN DATA				
Quantity of fans	1	2	2	1
Fan diameter (Inch)	22	22	22	30

XXA7, XX08-09, XX12 (Continued)

Component	Models											
	XXA7			XX08			XX09			XX12		
Nominal Tonnage	6			7.5			8.5			10		
Type	Prop			Prop			Prop			Prop		
Drive type	DIRECT DRIVE			DIRECT DRIVE			DIRECT DRIVE			DIRECT DRIVE		
Number of motors	1			2			2			1		
Motor HP each	1/2			1/2			1/2			1 1/2		
No. speeds	1			1			1			1		
RPM	1085			1085			1085			1140		
Total CFM	4600			7600			7600			9700		

EVAP FAN DATA BELT DRIVE												
Airflow Option	A	B	C	A	B	C	A	B	C	A	B	C
Quantity	1			1			1			1		
Fan diameter (Inch)	11 x 10			15 x 15			15 x 15			15 x 15		
Type	Centrifugal			Centrifugal			Centrifugal			Centrifugal		
Motor Sheave	1VL34	1VL44	1VP50	1VL34	1VL44	1VP50	1VL34	1VL44	1VP50	1VL34	1VP50	1VP56
Blower Sheave	AK51	AK51	AK51	AK74	AK74	AK74	AK74	AK74	AK74	AK79	AK79	AKBK85
Belt	A39	A40	A41	A47	A48	A50	A47	A48	A50	A50	A50	BX52
Motor Max BHP, 3 Phase	2.4	2.9	3.7	2.4	2.4	3.7	2.4	2.4	3.7	2.4	3.7	5.25
RPM	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725
Frame size	56Y	56Y	56HZ	56Y	56Y	65HZ	56Y	56Y	65HZ	56Y	56HZ	145TY

FILTERS												
Quantity - Size	4 - (16 x 16 x 2) ¹			4 - (20 x 20 x 2) ¹			4 - (20 x 20 x 2) ¹			4 - (20 x 20 x 2) ¹		

1. 2-inch Throwaway, Standard, MERV 4 (Minimum Efficiency Reporting Value)

Operation

Sequence Of Operation

For XX units, a "Y1" call for the first stage of cooling is passed to the Unit Control Board (UCB) which then determines whether the requested operation is available and if so, which components to energize. With an "Y1" call for first stage cooling the UCB will determine if a first stage cooling output is valid as long as all safeties and time-delays allow a C1 output for cooling. The C1 relay on the UCB will close and send 24 volts to the compressor contactor starting the first stage compressor and also energizing a contactor starting the associated condenser fans. During any call for fan or cooling the FAN output on the UCB will energize the appropriate relay starting the supply fan.

If at any time a call for both heating and cooling are present, the heating operation will be performed. If operating, the cooling system is halted as with a completion of a call for cooling. Heating always takes priority.

Continuous Blower

By setting the room thermostat fan switch to "ON," the supply air blower will operate continuously.

Intermittent Blower

With the room thermostat fan switch set to "AUTO" and the system switch set to either the "AUTO" or "HEAT" settings, the blower is energized whenever a cooling or heating operation is requested. The blower is energized after any specified delay associated with the operation.

When energized, the indoor blower has a minimum run time of 30 seconds. Additionally, the indoor blower has a minimum off delay of 10 seconds.

No Outdoor Air Options

When the thermostat calls for cooling, the low-voltage control circuit from "R" to "Y1" and "G" is completed. The compressor and condenser fan motor are energized. After completing the specified fan on delay for cooling, the UCB will energize the blower motor.

Once the thermostat has been satisfied, it will de-energize Y1. If the compressor has satisfied its minimum run time, the compressor and condenser fan de-energize. Otherwise, the unit operates the cooling system until the minimum run time for the compressor has been completed. After the compressor de-energizes, the blower is stopped following the elapse of the fan off delay for cooling.

To be available, a compressor must not be locked-out due to a high or low-pressure switch or Evaporator Low Limit sensor (EC1) detecting a temperature below 26° F and the anti-short cycle delay (ASCD) must have elapsed.

Economizer With Single Enthalpy Sensor

When the room thermostat calls for cooling, the low voltage control circuit from "R" to "G" and "Y1" is completed. The UCB energizes the blower motor (if the fan switch on the room thermostat is set in the "AUTO" position) and drives the

economizer dampers from fully closed to their minimum position. If the enthalpy of the outdoor air is below the setpoint of the enthalpy controller (previously determined), "Y1" energizes the economizer. The dampers will modulate to maintain a constant supply air temperature as monitored by the discharge air sensor. If the outdoor air enthalpy is above the setpoint, "Y1" energizes the compressor and condenser fan motor only.

Once the thermostat has been satisfied, it will de-energize "Y1". If the compressor has satisfied its minimum run time, the compressor and condenser fan are de-energized. Otherwise, the unit operates the cooling system until the minimum run times for the compressor has been completed. After the compressor de-energizes, the blower is stopped following the elapse of the fan off delay for cooling, and the economizer damper goes to the closed position. If the unit is in continuous fan operation the economizer damper goes to the min. position.

Economizer With Dual Enthalpy Sensors

The operation with the dual enthalpy sensors is identical to the single sensor except that a second enthalpy sensor is mounted in the return air. This return air sensor allows the economizer to choose between outdoor air and return air, whichever has the lowest enthalpy value, to provide maximum operating efficiency.

Economizer With Power Exhaust

A unit equipped with an economizer (single or dual enthalpy) and a power exhaust operates as specified above with one addition. The power exhaust motor is energized 45 seconds after the actuator position exceeds the exhaust fan set point on the economizer control. As always, the "R" to "G" connection provides minimum position but does not provide power exhaust operation.

Motorized Outdoor Air Dampers

This system operation is the same as the units with no outdoor air options with one exception. When the "R" to "G" circuit is complete, the motorized damper drives open to a position set by the thumbwheel on the damper motor. When the "R" to "G" circuit is opened, the damper spring returns fully closed.

Cooling Operation Errors

Each cooling system is monitored for operation outside of the intended parameters. Errors are handled as described below. All system errors override minimum run times for compressors.

High-Pressure Limit Switch

During cooling operation, if a high-pressure limit switch opens, the UCB will de-energize the compressor, initiate the ASCD (Anti-short cycle delay), and stop the condenser fan. If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a high-pressure switch open three times within two hours of operation, the UCB will lock-out the associated compressor and sends an error message.

Low-Pressure Limit Switch

The low-pressure limit switch is not monitored during the initial 30 seconds of a cooling system's operation. For the following 30 seconds, the UCB will monitor the low-pressure switch to ensure it closes. If the low-pressure switch fails to close after the 30-second monitoring phase, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan.

Once the low-pressure switch has been proven (closed during the 30-second monitor period described above), the UCB will monitor the low-pressure limit switch for any openings. If the low-pressure switch opens for greater than 5 seconds, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan.

If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a low-pressure switch open three times within one hour of operation, the UCB will lock-out the compressor and send an error message.

Evaporator Low Limit

During cooling operation, if the **Evaporator Low Limit Sensor (EC1)** (Located on the Suction Line at the Evaporator Coil.) detects a temperature below 26 Deg. F (default), the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan. If the call for cooling is still present at the conclusion of the ASCD and the evaporator temperature (EC1) is above 39°F, the UCB will re-energize the halted compressor.

Should the evaporator low limit sensor (**EC1**) detect a temperature below 26°F three times within two hours of operation, the UCB will lock-out the associated compressor and flash an error message.

Low Ambient Cooling

To determine when to operate in low ambient mode, the UCB has an **Outdoor Air Temperature Sensor (OAT)** with a low ambient setpoint at 45°F (default). When the **OAT Sensor** senses a temperature below the low ambient setpoint and the thermostat is calling for cooling, the UCB will operate in the low ambient mode.

Low ambient mode operates the compressors in this manner:

10 minutes on, 5 minutes off. The indoor blower is operated throughout the cycle. The 5-minute off period is necessary to defrost the indoor coil.

Low ambient mode always begins with compressor operation. Compressor minimum run time may extend the minutes of compressor operation. The off cycle will begin immediately following the elapse of the minimum run time.

When operating in low ambient mode, an **Evaporator Low Limit Sensor (EC1)** temperature below 26°F will de-energize the compressor. If the call for cooling is still present at the end of the ASCD and the evaporator temperature (**EC1**) is above 39°F, the unit will resume operation.

Safety Controls

The unit control board monitors the following inputs for each cooling system:

1. An evaporator low limit sensor (**EC1**) (Located on the Suction Line at the Evaporator Coil.) to protect against low evaporator temperatures due to a low airflow or a low return air temperature, set at 26°F.
2. A high-pressure switch to protect against excessive discharge pressures due to a blocked condenser coil or a condenser motor failure, (opens at 650 ± 25 psig).
3. A low-pressure switch to protect against loss of refrigerant charge, (opens at 7 ± 3 psig).

The above pressure switches are hard-soldered to the unit. The refrigeration systems are independently monitored and controlled. On any fault, only the associated system will be affected by any safety/preventive action.

The unit control board monitors the temperature limit switch of electric heat units.

Compressor Protection

In addition to the external pressure switches, the compressor also has inherent (internal) protection. If there is an abnormal temperature rise in a compressor, the protector will open to shut down the compressor. The UCB incorporates features to minimize compressor wear and damage. An **Anti-Short Cycle Delay (ASCD)** is utilized to prevent operation of a compressor too soon after its previous run. Additionally, a minimum run time is imposed any time a compressor is energized.

The ASCD is initiated on unit start-up and on any compressor reset or lock-out.

Error Message

The UCB will initiate a error message associated with errors within the system.

Reset

Remove the call for cooling, by raising thermostat setting higher than the conditioned space temperature. This resets any pressure or evaporator low limit error messages.

Heating Sequence Of Operations

With or Without Electric Heat

When the thermostat calls for the first stage of heating, the low voltage control circuit is completed between "R" and "W1". The 24vac signal is passed through the UCB to the Fan, C1 and CN-Fan output Terminals and withholds a 24vac output to the H1 terminal assuring the reversing valve cannot be energized, except during defrost. If the ASCD timer is satisfied the UCB will energize compressor contactor M1.

If the compressor alone cannot satisfy the heating requirements, a second stage call from the thermostat completes the circuit between "R" and "W2". This 24vac signal is passed through the UCB H2 output terminal to the electric

heat section (if available). The total available kW of electric heat will be energized on a call for "W2".

Defrost Initiation

Defrost control implements a temperature differential, demand defrost algorithm. The heat pump is allowed to operate in the heating mode until the combination of outdoor ambient temperature and outdoor coil temperature indicate that defrosting is necessary. When the coil temperature is maintained below the initiate point for a given ambient temperature, continuously for 4-1/2 minutes, the heat pump is put into a defrost cycle. This 4-1/2 minute timer eliminates unnecessary defrost cycles caused by refrigeration surges such as those that occur at the start of a heating cycle.

For defrost, the UCB will signal the energizing of the reversing valve and de-energizing the systems condenser fan motor(s). The unit's optional electric first-stage heater is also energized via a 24-volt VAC output terminal labeled "H2".

Defrost Termination

The UCB terminates the defrost mode when either of the following two conditions are met;

1. The outdoor coil temperature sensor reaches 40°F, or
2. The maximum allowable defrost run time of 8 minutes.

Interval between Defrosts

A timed inhibit feature prevents the system from responding to a call for defrost less than 40 minutes after the initiation of the previous defrost. After this inhibit time has expired, temperature conditions must call for defrost continuously for 4- 1/2 minutes before another defrost cycle is initiated. A temperature inhibit feature prohibits defrost if the coil temperature is above 40°F. All defrost timing occurs only while the compressor is on.

Forced Defrost

A forced-defrost feature puts the system into a defrost cycle every 6 hours and 4 minutes to recirculate lubricants, unless the coil temperature is above 40°F. All defrost timing occurs only while the compressor is on.

For trouble shooting purposes, the defrost cycle can be manually initiated by selecting "Test Defrost" in the UCB menu.

Options/Accessories

Economizer

The Economizer can be a factory installed option or a field installed accessory. If factory installed, refer to the instructions included with the outdoor air hood to complete the assembly. Field installed Economizer accessories include complete instructions for installation.

There are two Economizer options. Each is specific to footprint:

1. Vertical Flow application with barometric relief standard.
2. Horizontal Flow application with barometric relief standard.

Power Exhaust

The Power Exhaust is a field installed accessory. Field installed Power Exhaust accessories include complete instructions for installation.

The Power Exhaust factory installed option is for Down Flow application only.

There are two field installed Power Exhaust accessories. Each is specific to footprint and unit voltage:

1. Down Flow application.
2. Horizontal Flow application that requires the purchase of a barometric relief hood.

Rain Hood

All of the hood components, including the mist eliminators, the gasketing and the hardware for assembling, are packaged and located between the condenser coil section and the main unit cabinet, if the unit has factory installed options. If field installed accessories are being installed all parts necessary for the installation comes in the accessory.

Indoor Air Quality AQ

Indoor Air Quality (indoor sensor input): Terminal AQ accepts a +2 to +10 VDC signal with respect to the (AQ1) terminal. When the signal is below its set point, the actuator is allowed to modulate normally in accordance with the enthalpy and mixed air sensor inputs. When the AQ signal exceeds its set point setting and there is no call for free cooling, the actuator is proportionately modulated from the 2 to 10 VDC signal, with 2 VDC corresponding to full closed and 10 VDC corresponding to full open. When there is no call for free cooling, the damper position is limited by the IAQ Max damper position setting. When the signal exceeds its set point (Demand Control Ventilation Set Point) setting and there is a call for free cooling, the actuator modulates from the minimum position to the full open position based on the highest call from either the mixed air sensor input or the AQ voltage input.

- Optional CO₂ Space Sensor Kit Part # 2AQ04700524B
- Optional CO₂ Sensor Kit Part # 2AQ04700624C

Blower Phasing

XX units are properly phased at the factory. Check for proper blower rotation. If the blower rotates in the wrong direction at start-up, the electrical connection to the unit is misphased. Change the phasing of the **Field Line Connection at the factory or field supplied disconnect** to obtain proper rotation.

CAUTION

When installing equipment in a facility with a 3 phase high-leg delta power supply, care must be taken to ensure that the high-leg conductor is not attached to either of the two legs of the (single phase, direct drive) X13 or ECM motors. Failure to do so can result in the motor acting erratically or not running at all.

Check for the high leg conductor by checking voltage of each phase to ground.

Example: A or L1 phase to ground, voltage reading is 120V. B or L2 phase to ground, voltage reading is 195 to 208V. C or L3 phase to ground, voltage reading is 120V. Therefore B or L2 phase is the high Leg. The high should always be wired to the center or B or L2 tap.

Note: Check all three phase motors and compressors for proper rotation after making a change. If it is necessary to change 3 phase motor rotation, swap A or L1 and C or L3 only.

Blower Rotation

Check for proper supply air blower rotation. If the blower is rotating backwards, the line voltage at the unit point of power connection is misphased (See 'BLOWER PHASING').

Table 10: Supply Air Limitations

Model (Size)	Supply Air (CFM)	
	Minimum	Maximum
XXA7 (6)	1500	2500
XX08 (7.5)	2250	3750
XX09 (8.5)	2550	4250
XX12 (10)	3000	5000

Belt Tension

The tension on the belt should be adjusted as shown in Figure 20.

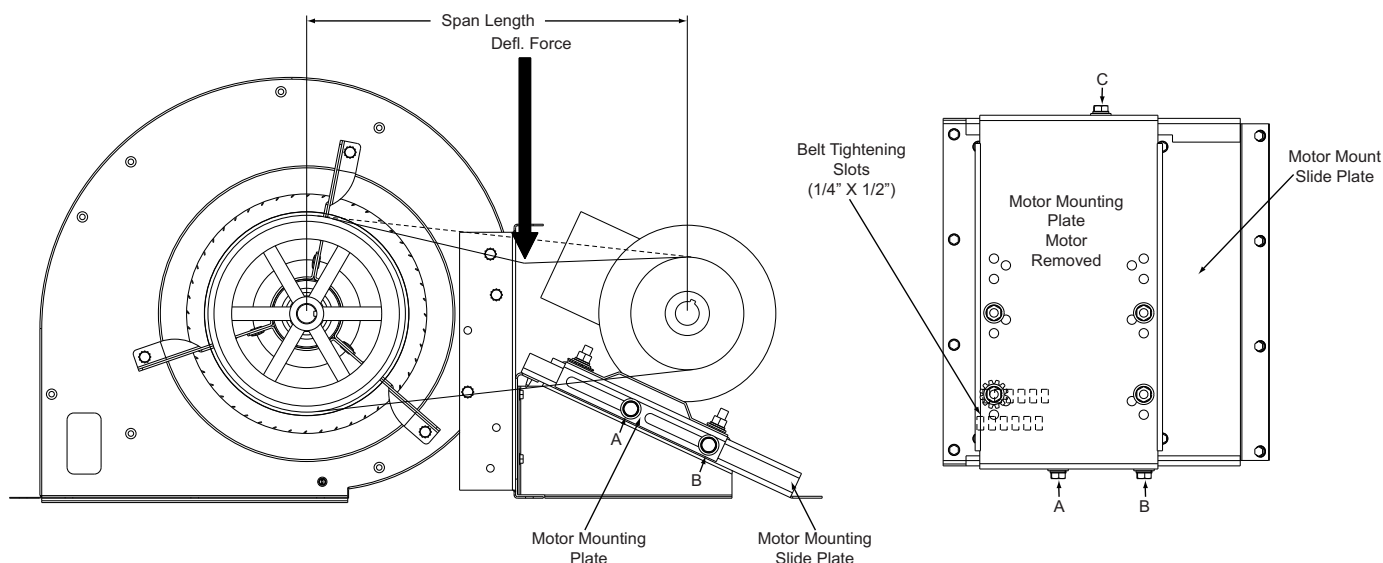


Figure 20: Belt Adjustment

 CAUTION

Procedure for adjusting belt tension:

1. Loosen the three nuts (A and B on side and C on back) of motor mount slide plate.
2. Adjust tension by placing a flat heat screwdriver into the belt tightening slots (1/4" X 1/2") in the motor mount slide plate and applying pressure against the motor mounting plate. See Figure 20.
3. Tighten the three loosened nuts (A, B and C).
4. Determine the deflection distance from normal position, use a straight edge from sheave to sheave as reference line. Use belt tension checker to apply a perpendicular force to the belt at the midpoint of the span as shown. Deflection distance of 4mm (5/32") is obtained.
5. After adjustments are completed re-tighten nuts (A, B and C).

Altitude and Temperature Correction for CFM, Static Pressure and Power.

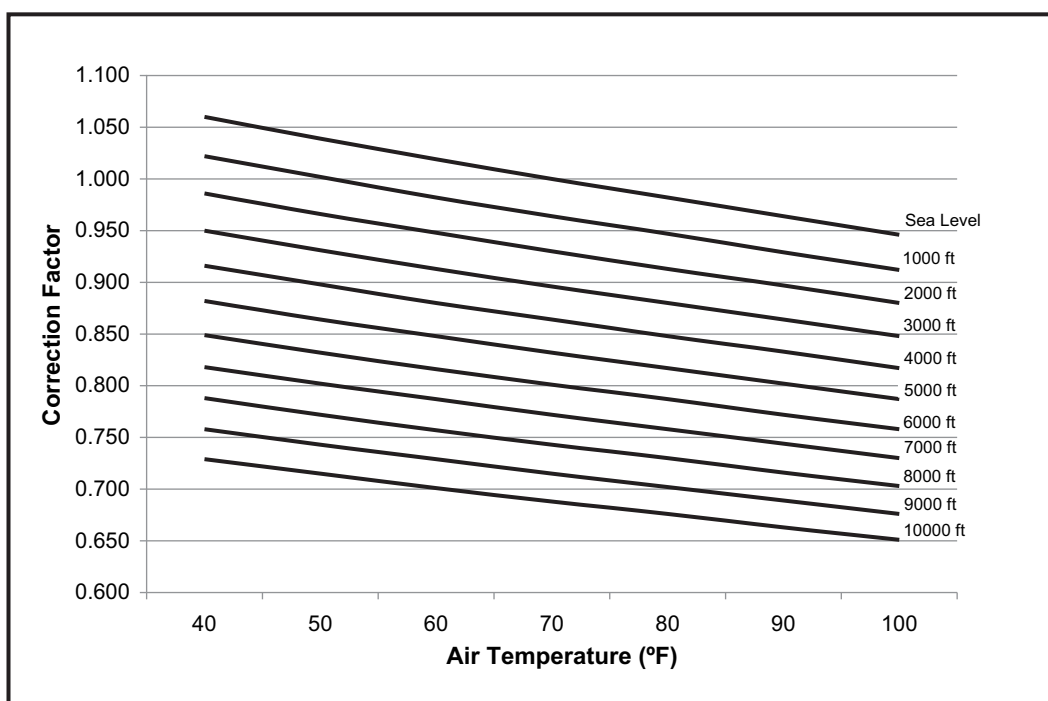
The information below should be used to assist in application of product when being applied at altitudes at or exceeding 1000 feet above sea level.

The air flow rates listed in the standard blower performance tables are based on standard air at sea level. As the altitude or temperature increases, the density of air decreases. In order to use the indoor blower tables for high altitude applications, certain corrections are necessary.

A centrifugal fan is a "constant volume" device. This means that, if the rpm remains constant, the CFM delivered is the same regardless of the density of the air. However, since the air at high altitude is less dense, less static pressure will be generated and less power will be required than a similar application at sea level. Air density correction factors are shown in Table 11 and Figure 21.

Table 11: Altitude/Temperature Correction Factors

Air Temp.	Altitude (Ft.)										
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
40	1.060	1.022	0.986	0.950	0.916	0.882	0.849	0.818	0.788	0.758	0.729
50	1.039	1.002	0.966	0.931	0.898	0.864	0.832	0.802	0.772	0.743	0.715
60	1.019	0.982	0.948	0.913	0.880	0.848	0.816	0.787	0.757	0.729	0.701
70	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.715	0.688
80	0.982	0.947	0.913	0.880	0.848	0.817	0.787	0.758	0.730	0.702	0.676
90	0.964	0.929	0.897	0.864	0.833	0.802	0.772	0.744	0.716	0.689	0.663
100	0.946	0.912	0.880	0.848	0.817	0.787	0.758	0.730	0.703	0.676	0.651

**Figure 21: Altitude/Temperature Correction Factors**

The examples below will assist in determining the airflow performance of the product at altitude.

Example 1: What are the corrected CFM, static pressure, and BHP at an elevation of 5,000 ft. if the airflow performance data is 3,000 CFM, 1.4 IWC and 2.0 BHP?

Solution: At an elevation of 5,000 ft. the indoor blower will still deliver 3,000 CFM if the rpm is unchanged. However, the Altitude correction must be used to determine the static pressure and BHP. Since no temperature data is given, we will assume an Air Temperature of 70°F. The Altitude/Temperature Factors show the correction factor to be 0.832.

$$\text{Corrected static pressure} = 1.4 \times 0.832 = 1.16 \text{ IWC}$$

$$\text{Corrected BHP} = 2.0 \times 0.832 = 1.66$$

Example 2: A system, located at 5,000 feet of elevation, is to deliver 3,000 CFM at a static pressure of 1.4". Use the unit blower tables to select the blower speed and the BHP requirement.

Solution: As in the example above, no temperature information is given so 70°F is assumed.

The 1.4" static pressure given is at an elevation of 5,000 ft. The first step is to convert this static pressure to equivalent sea level conditions.

$$\text{Sea level static pressure} = 1.4" / .832 = 1.68"$$

Enter the Supply Air Blower Performance Table at 3,000 CFM and static pressure of 1.68". The rpm listed will be the same rpm needed at 5,000 ft.

Suppose that the corresponding BHP listed in the table is 2.0. This value must be corrected for elevation.

$$\text{BHP at 5,000 ft.} = 2.0 \times .832 = 1.66$$

Drive Selection

1. Determine side or bottom supply duct Application.
2. Determine desired airflow.
3. Calculate or measure the amount of external static pressure.
 - Add or deduct any additional static resistance from "Additional Static Resistance Table".
4. Using the operating point determined from steps 1, 2 & 3, locate this point on the appropriate supply air blower performance table. (Linear interpolation may be necessary.)
5. Noting the RPM and BHP from step 4, locate the appropriate motor and, or drive.
6. Review the BHP compared to the motor options available. Select the appropriate motor and, or drive.
7. Review the RPM range for the motor options available. Select the appropriate drive if multiple drives are available for the chosen motor.
8. Determine turns open to obtain the desired operation point.

Example

1. 3600 CFM
2. 1.4 iwg
3. Using the airflow performance table below, the following data point was located: 1000 RPM & 2.69 BHP.
4. Using the RPM selection table below, Model XX and Size 12 (10 Tons) is found.
5. The Medium Static Option is selected to achieve the required 1000 RPM.
6. Using the Medium Static Option, fully closed will achieve 1000 RPM.

Airflow Performance

XX12 (10 Ton) Bottom Duct

CFM	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000			665	0.84	715	1.05	763	1.25	809	1.45	855	1.64	901	1.84	947	2.04	995	2.26	1045	2.48
3200			675	1.01	726	1.22	774	1.42	820	1.61	866	1.81	911	2.01	958	2.21	1005	2.42	1055	2.65
3400			687	1.19	737	1.40	785	1.60	832	1.80	878	1.99	923	2.19	970	2.40	1017	2.61	1067	2.83
3600			700	1.39	750	1.60	798	1.80	845	2.00	891	2.20	936	2.39	983	2.60	1030	2.81	1080	3.04
3800	662	1.39	715	1.61	765	1.82	813	2.02	859	2.22	905	2.41	951	2.61	997	2.81	1045	3.03	1094	3.25
4000	677	1.62	730	1.84	780	2.05	828	2.26	875	2.45	921	2.65	966	2.85	1013	3.05	1060	3.26	1110	3.49
4200	694	1.87	747	2.09	797	2.30	845	2.50	892	2.70	937	2.90	983	3.09	1029	3.30	1077	3.51	1127	3.74
4400	712	2.13	765	2.35	815	2.57	863	2.77	910	2.96	956	3.16	1001	3.36	1048	3.56	1095	3.77	1145	4.00
4600	732	2.41	785	2.63	835	2.84	883	3.04	929	3.24	975	3.44	1021	3.63	1067	3.84	1115	4.05	1165	4.28
4800	752	2.70	805	2.92	856	3.13	904	3.33	950	3.53	996	3.73	1041	3.92	1088	4.13	1135	4.34	-	-
5000	774	3.00	827	3.22	878	3.43	925	3.64	972	3.83	1018	4.03	1063	4.23	1110	4.43	1157	4.64	-	-

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 3.7-hp
	Field Supplied AK84 x 1 fixed pulley with Motor rated at 3.7-hp
	High Static Option with Motor rated at 5.25-hp
--	Exceeds recommended blower speed

Example RPM Selection

Model	Size (Tons)	Airflow Option	Phase	Max BHP	Blower Sheave	Motor Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turns Open	Fully Closed
XX	12 (10)	Std.	3	2.4	AK79	1VL44	N/A	653	700	747	793	840	887
		Med.	3	3.7	AK79	1VP50	N/A	793	840	887	933	980	1027
		H. Static	3	5.25	BK85	1VP56	953	997	1041	1085	1130	1174	N/A

Example Additional Static Resistance

Model	Size (Tons)	CFM	Economizer	2" Filter	Electric Heat kW				
					---	---	---	---	---
XXE	12 (10.0)	2200	0.04	0.11	---	0.07	0.09	0.10	0.12
		2600	0.06	0.13	---	0.09	0.11	0.12	0.15
		3000	0.10	0.17	---	0.12	0.14	0.15	0.19
		3400	0.13	0.20	---	0.15	0.18	0.19	0.23
		3800	0.16	0.25	---	0.19	0.22	0.23	0.27
		4000	0.17	0.28	---	0.21	0.24	0.25	0.30
		4400	0.20	0.33	---	0.25	0.29	0.30	0.35
		4800	0.22	0.38	---	0.30	0.34	0.35	0.41
		5200	0.24	0.43	---	0.35	0.39	0.41	0.47
		5600	0.26	0.46	---	0.41	0.45	0.47	0.54
		6000	0.28	0.50	---	0.48	0.52	0.54	0.60

Table 12: XXA7, XX08 - XX09, XX12 Side Duct Application (Belt Drive)**XXA7 (6.0 Ton) Side Duct**

CFM	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	845	0.46	901	0.58	959	0.71	1017	0.83	1076	0.96	1133	1.08	1188	1.21	1240	1.34	1288	1.47	1332	1.60
1900	860	0.53	917	0.66	974	0.78	1033	0.91	1091	1.03	1148	1.16	1203	1.28	1255	1.41	1303	1.54	1347	1.68
2000	878	0.62	934	0.74	992	0.86	1050	0.99	1108	1.11	1165	1.24	1220	1.36	1272	1.49	1321	1.62	1365	1.76
2100	897	0.70	954	0.83	1011	0.95	1070	1.08	1128	1.20	1185	1.33	1240	1.45	1292	1.58	1340	1.71	1384	1.84
2200	919	0.80	975	0.92	1033	1.05	1091	1.17	1149	1.29	1206	1.42	1261	1.55	1313	1.68	1362	1.81	1406	1.94
2300	942	0.90	998	1.02	1056	1.15	1114	1.27	1172	1.40	1229	1.52	1284	1.65	1336	1.78	1385	1.91	1429	2.04
2400	966	1.01	1022	1.14	1080	1.26	1138	1.38	1196	1.51	1253	1.63	1308	1.76	1361	1.89	1409	2.02	1453	2.15
2500	992	1.13	1048	1.25	1106	1.38	1164	1.50	1222	1.63	1279	1.75	1334	1.88	1386	2.01	1435	2.14	1479	2.27
2600	1018	1.26	1075	1.38	1132	1.51	1191	1.63	1249	1.76	1306	1.88	1361	2.01	1413	2.14	1461	2.27	1505	2.40
2700	1046	1.40	1102	1.52	1160	1.64	1218	1.77	1276	1.89	1333	2.02	1388	2.14	1441	2.27	1489	2.40	1533	2.54
2800	1075	1.54	1131	1.67	1188	1.79	1247	1.91	1305	2.04	1362	2.16	1417	2.29	1469	2.42	1518	2.55	1561	2.68
2900	1104	1.70	1160	1.82	1218	1.94	1276	2.07	1334	2.19	1391	2.32	1446	2.45	1498	2.57	1547	2.70	1591	2.84
3000	1134	1.86	1190	1.98	1248	2.11	1306	2.23	1364	2.36	1421	2.48	1476	2.61	1528	2.74	1577	2.87	1621	3.00

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 2.9-hp
	High Static Option with Motor rated at 3.7-hp
-	Exceeds recommended blower speed

Note: See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.

$$\text{kW} = 0.929 \times \text{BHP}$$

XX08 (7.5 Ton) Side Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	562	0.17	616	0.36	671	0.57	726	0.78	781	1.00	835	1.20	886	1.40	935	1.59	979	1.75	1019	1.89
2400	567	0.26	620	0.45	675	0.65	730	0.87	785	1.08	839	1.29	890	1.49	939	1.67	983	1.84	1023	1.97
2600	572	0.38	625	0.58	680	0.78	736	0.99	790	1.21	844	1.42	895	1.62	944	1.80	989	1.96	1029	2.10
2800	578	0.53	632	0.72	687	0.93	742	1.14	797	1.35	850	1.56	902	1.76	950	1.95	995	2.11	1035	2.24
3000	586	0.69	639	0.88	694	1.08	749	1.30	804	1.51	858	1.72	909	1.92	958	2.10	1002	2.27	1043	2.40
3200	595	0.86	648	1.05	703	1.25	758	1.46	813	1.68	867	1.89	918	2.09	967	2.27	1012	2.43	1052	2.57
3400	606	1.03	660	1.23	714	1.43	770	1.64	824	1.86	878	2.07	930	2.27	978	2.45	1023	2.61	1063	2.75
3600	619	1.22	673	1.41	728	1.62	783	1.83	838	2.04	891	2.25	943	2.45	991	2.63	1036	2.80	1076	2.93
3750	631	1.36	684	1.55	739	1.76	794	1.97	849	2.19	903	2.39	954	2.59	1003	2.78	1047	2.94	1087	3.08

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 2.4-hp
	High Static Option with Motor rated at 3.7-hp

$$\text{kW} = 0.929 \times \text{BHP for Standard \& Medium Static options} \quad \text{kW} = 0.895 \times \text{BHP for High Static option}$$

XX09 (8.5 Ton) Side Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	571	0.35	624	0.54	679	0.75	734	0.96	789	1.17	843	1.38	894	1.58	943	1.77	987	1.93	1027	2.07
2600	572	0.38	625	0.58	680	0.78	736	0.99	790	1.21	844	1.42	895	1.62	944	1.80	989	1.96	1029	2.10
2800	578	0.53	632	0.72	687	0.93	742	1.14	797	1.35	850	1.56	902	1.76	950	1.95	995	2.11	1035	2.24
3000	586	0.69	639	0.88	694	1.08	749	1.30	804	1.51	858	1.72	909	1.92	958	2.10	1002	2.27	1043	2.40
3200	595	0.86	648	1.05	703	1.25	758	1.46	813	1.68	867	1.89	918	2.09	967	2.27	1012	2.43	1052	2.57
3400	606	1.03	660	1.23	714	1.43	770	1.64	824	1.86	878	2.07	930	2.27	978	2.45	1023	2.61	1063	2.75
3600	619	1.22	673	1.41	728	1.62	783	1.83	838	2.04	891	2.25	943	2.45	991	2.63	1036	2.80	1076	2.93
3800	635	1.41	688	1.60	743	1.81	798	2.02	853	2.23	907	2.44	958	2.64	1007	2.83	1051	2.99	1091	3.13
4000	652	1.61	706	1.80	761	2.01	816	2.22	871	2.43	924	2.64	976	2.84	1024	3.02	1069	3.19	--	--
4200	672	1.81	726	2.00	781	2.21	836	2.42	891	2.64	944	2.84	996	3.04	1044	3.23	1089	3.39	--	--
4250	678	1.86	731	2.06	786	2.26	841	2.47	896	2.69	950	2.90	1001	3.10	1050	3.28	1094	3.44	--	--

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 2.4-hp
	High Static Option with Motor rated at 3.7-hp
Bold	Field-supplied AK79 x 1 fixed pulley with Motor rated at 3.7-hp
--	Exceeds recommended blower speed

kW = 0.929 x BHP for Standard & Medium Static options
kW = 0.895 x BHP for High Static option

XX12 (10 Ton) Side Duct

CFM	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000			665	0.63	707	0.90	750	1.15	795	1.39	842	1.62	888	1.85	935	2.07	980	2.30	1024	2.53
3200			673	0.79	714	1.06	758	1.31	803	1.56	849	1.79	896	2.01	942	2.24	988	2.47	1032	2.70
3400			682	0.97	723	1.24	767	1.50	812	1.74	858	1.97	905	2.20	951	2.42	997	2.65	1041	2.88
3600	654	0.88	692	1.17	733	1.44	777	1.69	822	1.93	868	2.17	915	2.39	961	2.62	1007	2.84	1051	3.08
3800	665	1.10	704	1.38	745	1.65	788	1.91	834	2.15	880	2.38	927	2.61	973	2.83	1018	3.06	1062	3.29
4000	678	1.32	717	1.61	758	1.88	801	2.13	847	2.37	893	2.61	940	2.83	986	3.06	1032	3.28	1076	3.52
4200	693	1.57	731	1.85	772	2.12	816	2.37	861	2.62	907	2.85	954	3.07	1000	3.30	1046	3.53	1090	3.76
4400	709	1.82	747	2.11	788	2.38	832	2.63	877	2.87	923	3.10	970	3.33	1016	3.55	1062	3.78	1106	4.01
4600	726	2.09	764	2.37	806	2.64	849	2.90	894	3.14	941	3.37	987	3.60	1034	3.82	1079	4.05	1123	4.28
4800	745	2.37	783	2.65	824	2.92	868	3.18	913	3.42	959	3.65	1006	3.88	1052	4.10	1098	4.33	1142	4.56
5000	765	2.66	803	2.95	844	3.22	888	3.47	933	3.71	979	3.94	1026	4.17	1072	4.39	1118	4.62	1162	4.85

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 3.7-hp
Bold	Field Supplied AK84 x 1 fixed pulley with Motor rated at 3.7-hp
	High Static Option with Motor rated at 5.25-hp
	Exceeds recommended blower speed

Table 13: XXA7, XX08 - XX09, XX12 Bottom Duct Application (Belt Drive)

XXA7 (6.0 Ton) Bottom Duct

CFM	Available External Static Pressure - IWG													
	0.2		0.4		0.6		0.8		1.0		1.2		1.4	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	843	0.55	911	0.66	975	0.79	1035	0.93	1092	1.07	1148	1.21	1203	1.36
1900	870	0.62	939	0.74	1003	0.86	1063	1.00	1120	1.14	1175	1.29	1230	1.43
2000	898	0.70	967	0.82	1031	0.95	1090	1.08	1147	1.22	1203	1.37	1258	1.51
2100	926	0.79	995	0.91	1059	1.04	1119	1.17	1176	1.31	1231	1.46	1286	1.60
2200	955	0.89	1023	1.01	1087	1.14	1147	1.27	1204	1.41	1260	1.56	1315	1.70
2300	983	1.00	1052	1.12	1116	1.24	1176	1.38	1233	1.52	1288	1.67	1343	1.81
2400	1012	1.12	1081	1.23	1145	1.36	1205	1.50	1262	1.64	1317	1.79	1372	1.93
2500	1041	1.25	1110	1.36	1173	1.49	1233	1.63	1290	1.77	1346	1.91	1401	2.06
2600	1070	1.38	1139	1.50	1202	1.63	1262	1.77	1319	1.91	1375	2.05	1430	2.19
2700	1098	1.53	1167	1.65	1231	1.78	1291	1.91	1348	2.06	1404	2.20	1459	2.34
2800	1127	1.69	1196	1.80	1260	1.93	1320	2.07	1377	2.21	1432	2.36	1487	2.50
2900	1156	1.85	1225	1.97	1289	2.10	1348	2.24	1406	2.38	1461	2.52	1516	2.66
3000	1184	2.03	1253	2.14	1317	2.27	1377	2.41	1434	2.55	1490	2.69	1545	2.84

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 2.9-hp
	High Static Option with Motor rated at 3.7-hp
--	Exceeds recommended blower speed

Note: See RPM SELECTION table to determine desired motor sheave setting and to determine the maximum continuous BHP.

$$kW = 0.929 \times BHP$$

XX08 (7.5 Ton) Bottom Duct

CFM	Available External Static													
	0.2		0.4		0.6		0.8		1.0		1.2		1.4	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	552	0.25	614	0.43	674	0.63	733	0.83	789	1.02	844	1.22	898	1.41
2400	559	0.34	621	0.52	682	0.72	740	0.91	797	1.11	852	1.31	905	1.49
2600	569	0.47	631	0.65	691	0.85	750	1.04	806	1.24	861	1.44	915	1.62
2800	579	0.61	641	0.79	701	0.99	760	1.19	817	1.38	872	1.58	925	1.77
3000	590	0.76	652	0.95	713	1.14	771	1.34	828	1.54	883	1.73	936	1.92
3200	602	0.92	665	1.11	725	1.30	783	1.50	840	1.70	895	1.89	948	2.08
3400	616	1.09	678	1.28	738	1.47	797	1.67	854	1.87	909	2.06	962	2.25
3600	631	1.27	693	1.45	754	1.65	812	1.85	869	2.04	924	2.24	977	2.43
3750	644	1.40	706	1.59	766	1.78	824	1.98	881	2.18	936	2.37	990	2.56

	Standard Static Option with Motor rated at 2.4-hp
	Medium Static Option with Motor rated at 2.4-hp
	High Static Option with Motor rated at 3.7-hp
--	Exceeds recommended blower speed

$$kW = 0.929 \times BHP \text{ for Standard \& Medium Static options } kW = 0.895 \times BHP \text{ for High Static option}$$

XX09 (8.5 Ton) Bottom Duct

CFM	Available External Static															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	567	0.43	629	0.62	689	0.81	747	1.01	804	1.21	859	1.40	912	1.59	964	1.77
2600	569	0.47	631	0.65	691	0.85	750	1.04	806	1.24	861	1.44	915	1.62	967	1.80
2800	579	0.61	641	0.79	701	0.99	760	1.19	817	1.38	872	1.58	925	1.77	977	1.94
3000	590	0.76	652	0.95	713	1.14	771	1.34	828	1.54	883	1.73	936	1.92	988	2.10
3200	602	0.92	665	1.11	725	1.30	783	1.50	840	1.70	895	1.89	948	2.08	1000	2.26
3400	616	1.09	678	1.28	738	1.47	797	1.67	854	1.87	909	2.06	962	2.25	1014	2.43
3600	631	1.27	693	1.45	754	1.65	812	1.85	869	2.04	924	2.24	977	2.43	1029	2.60
3800	648	1.45	710	1.64	770	1.83	829	2.03	885	2.23	940	2.42	994	2.61	1046	2.78
4000	666	1.64	729	1.82	789	2.01	847	2.21	904	2.41	959	2.61	1012	2.79	1064	2.97
4200	687	1.82	749	2.01	809	2.20	867	2.42	924	2.60	979	2.79	1032	2.98	1084	3.16
4250	692	1.87	754	2.06	814	2.25	873	2.45	929	2.65	984	2.84	1038	3.03	1090	3.21



Standard Static Option with Motor rated at 2.4-hp

Medium Static Option with Motor rated at 2.4-hp

High Static Option with Motor rated at 3.7-hp

Exceeds recommended blower speed

kW = 0.929 x BHP for Standard & Medium Static options kW = 0.895 x BHP for High Static option

XX12 (10 Ton) Bottom Duct

CFM	Available External Static Pressure - IWG															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000			665	0.84	715	1.05	763	1.25	809	1.45	855	1.64	901	1.84	947	2.04
3200			675	1.01	726	1.22	774	1.42	820	1.61	866	1.81	911	2.01	958	2.21
3400			687	1.19	737	1.40	785	1.60	832	1.80	878	1.99	923	2.19	970	2.40
3600			700	1.39	750	1.60	798	1.80	845	2.00	891	2.20	936	2.39	983	2.60
3800	662	1.39	715	1.61	765	1.82	813	2.02	859	2.22	905	2.41	951	2.61	997	2.81
4000	677	1.62	730	1.84	780	2.05	828	2.26	875	2.45	921	2.65	966	2.85	1013	3.05
4200	694	1.87	747	2.09	797	2.30	845	2.50	892	2.70	937	2.90	983	3.09	1029	3.30
4400	712	2.13	765	2.35	815	2.57	863	2.77	910	2.96	956	3.16	1001	3.36	1048	3.56
4600	732	2.41	785	2.63	835	2.84	883	3.04	929	3.24	975	3.44	1021	3.63	1067	3.84
4800	752	2.70	805	2.92	856	3.13	904	3.33	950	3.53	996	3.73	1041	3.92	1088	4.13
5000	774	3.00	827	3.22	878	3.43	925	3.64	972	3.83	1018	4.03	1063	4.23	1110	4.43



Standard Static Option with Motor rated at 2.4-hp

Medium Static Option with Motor rated at 3.7-hp

Field Supplied AK84 x 1 fixed pulley with Motor rated at 3.7-hp

High Static Option with Motor rated at 5.25-hp

Exceeds recommended blower speed

Table 14: RPM Selection

Model	Size (Tons)	Airflow Option	Phase	Max BHP	Blower Sheave	Motor Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turns Open	Fully Closed
XX	A7 (6)	Std.	3	2.4	AK51	1VL34	N/A	707	782	856	931	1005	1080
		Med.	3	2.9	AK51	1VL44	N/A	1043	1117	1191	1266	1340	1415
		H. Static	3	3.7	AK51	1VP50	N/A	1266	1340	1415	1489	1564	1638
XX	08 (7.5)	Std.	3	2.4	AK74	1VL34	N/A	475	525	575	625	675	725
		Med.	3	2.4	AK74	1VL44	N/A	700	750	800	850	900	950
		H. Static	3	3.7	AK74	1VP50	N/A	850	900	950	1000	1050	1100
XX	09 (8.5)	Std.	3	2.4	AK74	1VL34	N/A	475	525	575	625	675	725
		Med.	3	2.4	AK74	1VL44	N/A	700	750	800	850	900	950
		H. Static	3	3.7	AK74	1VP50	N/A	850	900	950	1000	1050	1100
XX	12 (10)	Std.	3	2.4	AK79	1VL44	N/A	653	700	747	793	840	887
		Med.	3	3.7	AK79	1VP50	N/A	793	840	887	933	980	1027
		H. Static	3	5.25	BK85	1VP56	953	997	1041	1085	1130	1174	N/A

Table 15: Indoor Blower Specifications

Model	Size (Tons)	Airflow Option	Motor						Motor Sheave			Blower Sheave			Belt
			Phase	Max BHP	RPM	Eff.	SF	Frame	Datum Dia. (in.)	Bore (in.)	Model	Datum Dia. (in.)	Bore (in.)	Model	
XX	A7 (6)	Std.	3	2.4	1725	0.80	1.15	56Y	1.9 - 2.9	5/8	1VL34	7.0	1	AK74	A47
		Med.	3	2.9	1725	0.81	1.15	56Y	2.8 - 3.8	7/8	1VL44	7.0	1	AK74	A48
		H. Static	3	3.7	1725	0.84	1.15	56HZ	3.4 - 4.4	7/8	1VP50	7.0	1	AK74	A48
XX	08 (7.5)	Std.	3	2.4	1725	0.80	1.15	56Y	1.9 - 2.9	5/8	1VL34	7.0	1	AK74	A47
		Med.	3	2.4	1725	0.80	1.15	56Y	2.8 - 3.8	5/8	1VL44	7.0	1	AK74	A48
		H. Static	3	3.7	1725	0.84	1.15	56HZ	3.4 - 4.4	7/8	1VP50	7.0	1	AK74	A50
XX	09 (8.5)	Std.	3	2.4	1725	0.80	1.15	56Y	1.9 - 2.9	5/8	1VL34	7.0	1	AK74	A47
		Med.	3	2.4	1725	0.80	1.15	56Y	2.8 - 3.8	5/8	1VL44	7.0	1	AK74	A48
		H. Static	3	3.7	1725	0.84	1.15	56HZ	3.4 - 4.4	7/8	1VP50	7.0	1	AK74	A50
XX	12 (10)	Std.	3	2.4	1725	0.80	1.15	56Y	2.8 - 3.8	5/8	1VL44	7.5	1	AK79	A50
		Med.	3	3.7	1725	0.84	1.15	56HZ	3.4 - 4.4	7/8	1VP50	7.5	1	AK79	A50
		H. Static	3	5.25	1725	0.84	1.15	145TY	4.3 - 5.3	7/8	1VP56	7.9	1	BK85	BX52

Supply Air Drive Adjustment

CAUTION

Before making any blower speed changes review the installation for any installation errors, leaks or undesirable systems effects that can result in loss of airflow.

Even small changes in blower speed can result in substantial changes in static pressure and BHP. BHP and AMP draw of the blower motor will increase by the cube of the blower speed. Static pressure will increase by the square of the blower speed. Only qualified personnel should make blower speed changes, strictly adhering to the fan laws.

At unit start-up, the measured CFM may be higher or lower than the required CFM. To achieve the required CFM, the speed of the drive may have adjusted by changing the datum diameter (DD) of the variable pitch motor sheave as described below:

$$\left(\frac{\text{Required CFM}}{\text{Measured CFM}} \right)^3 \cdot \text{Existing DD} = \text{New DD}$$

Use the following tables and the DD calculated per the above equation to adjust the motor variable pitch sheave.

EXAMPLE NEW DATUM DIAMETER

A 4 ton unit was selected to deliver 1,600 CFM with a 1VL34 motor sheave, but the unit is delivering 1,350 CFM. The variable pitch motor sheave is set at 4 turns open.

Use the equation to determine the required DD for the new motor sheave,

$$\left(\frac{1,600 \text{ CFM}}{1,350 \text{ CFM}} \right)^3 \cdot 2.1 \text{ in.} = 2.48 \text{ in.}$$

Use Table 16 to locate the DD nearest to 2.48 in. Close the sheave to 2 turn open.

EXAMPLE NEW BHP

$$= (\text{Speed increase})^3 \cdot \text{Original BHP} = \text{New BHP}$$

$$= (\text{Speed increase})^3 \cdot \text{BHP at 1,350 CFM}$$

EXAMPLE NEW MOTOR AMPS

$$= (\text{Speed increase})^3 \cdot \text{Original Amps} = \text{New Amps}$$

$$= (\text{Speed increase})^3 \cdot \text{Amps at 1,350 CFM}$$

Table 16: Motor Sheave Datum Diameters

1VL44		1VP50		1VP56	
Turns Open	Datum Diameter	Turns Open	Datum Diameter	Turns Open	Datum Diameter
0	3.8	0	4.4	0	-
1/2	3.7	1/2	4.3	1/2	-
1	3.6	1	4.2	1	5.3
1-1/2	3.5	1-1/2	4.1	1-1/2	5.2
2	3.4	2	4.0	2	5.1
2-1/2	3.3	2-1/2	3.9	2-1/2	5.0
3	3.2	3	3.8	3	4.9
3-1/2	3.1	3-1/2	3.7	3-1/2	4.8
4	3.0	4	3.6	4	4.7
4-1/2	2.9	4-1/2	3.5	4-1/2	4.6
5	2.8	5	3.4	5	4.5
5-1/2	-	5-1/2	-	5-1/2	4.4
6	-	6	-	6	4.3

CAUTION

Belt drive blower systems MUST be adjusted to the specific static and CFM requirements for the application. The Belt drive blowers are NOT set at the factory for any specific static or CFM. Adjustments of the blower speed and belt tension are REQUIRED. Verify proper sheave alignment; tighten blower pulley and motor sheave set screws after these adjustments. Re-checking set screws and belt tension after 10-12 hrs. run time is recommended.

Table 17: Additional Static Resistance - XXA7

Model	Size (Tons)	CFM	Economizer ^{1 2}	4" Filter ²	Electric Heat kW ²							
					6/6.5	9.2/10.5/11	13.8/14/16	16/16.5/17	23	24.8/25.5/27.8	32/33/34	41.7/42.4
XX	A7 (6.0)	1800	0.13	---	0.03	0.03	0.05	---	---	---	---	---
		2000	0.15	---	0.04	0.04	0.06	---	---	---	---	---
		2200	0.18	---	0.06	0.06	0.07	---	---	---	---	---
		2400	0.21	---	0.07	0.07	0.08	---	---	---	---	---
		2600	0.24	---	0.08	0.08	0.09	---	---	---	---	---
		2800	0.29	---	0.09	0.09	0.10	---	---	---	---	---
		3000	0.35	---	0.11	0.11	0.12	---	---	---	---	---

1. Deduct these values from the available external static pressure shown in the respective Blower Performance Tables.
2. The pressure drop through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

Table 18: Additional Static Resistance - XX08 - 09, XX12

Model	Size (Tons)	CFM	Economizer ^{1 2}	4" Filter ¹	Electric Heat kW ²			
					16/16.5/17	24.8/25.5/27.8	32/33/34	41.7/42.4
XX	08 (7.5), 09 (8.5)	2200	0.11	---	0.07	0.09	0.10	0.12
		2600	0.13	---	0.09	0.11	0.12	0.15
		3000	0.17	---	0.12	0.14	0.15	0.19
		3400	0.20	---	0.15	0.18	0.19	0.23
		3800	0.25	---	0.19	0.22	0.23	0.27
		4000	0.28	---	0.21	0.24	0.25	0.30
		4400	0.33	---	0.25	0.29	0.30	0.35
		4800	0.38	---	0.30	0.34	0.35	0.41
		5200	0.43	---	0.35	0.39	0.41	0.47
		5600	0.46	---	0.41	0.45	0.47	0.54
XX	12 (10.0)	6000	0.50	---	0.48	0.52	0.54	0.60
		2200	0.11	---	0.07	0.09	0.10	0.12
		2600	0.13	---	0.09	0.11	0.12	0.15
		3000	0.17	---	0.12	0.14	0.15	0.19
		3400	0.20	---	0.15	0.18	0.19	0.23
		3800	0.25	---	0.19	0.22	0.23	0.27
		4000	0.28	---	0.21	0.24	0.25	0.30
		4400	0.33	---	0.25	0.29	0.30	0.35
		4800	0.38	---	0.30	0.34	0.35	0.41
		5200	0.43	---	0.35	0.39	0.41	0.47
		5600	0.46	---	0.41	0.45	0.47	0.54
		6000	0.50	---	0.48	0.52	0.54	0.60

1. Deduct these values from the available external static pressure shown in the respective Blower Performance Tables.
2. The pressure drop through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.



Description		Function & Comments
Terminal Directional orientation: viewed with silkscreen labels upright		
Limit, 24 VAC power and shutdown connections from unit wiring harness at left on upper edge of UCB		
LIMIT	Monitored 24 VAC input through heat section limit switch(es)	If voltage is absent, indicating the heat section is over-temperature, the UCB will bring on the indoor blower
C	24 VAC, 75 VA transformer Common referenced to cabinet ground	Connects through circuit traces to thermostat connection strip C and indoor blower VFD pin C
24V	24 VAC, 75 VA transformer hot	Powers the UCB microprocessor, connects through circuit trace to the SD 24 terminal
SD 24	24 VAC hot out for factory accessory smoke detector, condensate overflow and/or user shutdown relay switching in series	Connects through circuit trace to thermostat connection strip SD-24. A wiring harness jumper plug connecting SD 24 to SD R is in place if factory accessories for unit shutdown are not used - this jumper plug must be removed if the switching of field-added external accessories for unit shutdown are wired between thermostat connection strip SD-24 and R
SD R	24 VAC hot return from factory accessory smoke detector, condensate overflow and user shutdown relay switching in series	Connects through circuit trace to the R terminal on the upper left of the board

Table 19: Smart Equipment™ UCB Details (Continued)

Description		Function & Comments
R	24 VAC hot for switched inputs to the UCB	Connects through circuit trace to the thermostat connection strip R terminal, right FAN OVR pin, right HPS1 pin, right HPS2 pin, lower DFS pin and lower APS pin
Terminal Thermostat connection strip on left edge of UCB		
W1	1st stage heating request, 24 VAC input switched from R	Not effective for cooling-only units
W2	2nd stage heating request, 24 VAC input switched from R	Not effective for cooling-only units or units with single-stage heat sections
Y1	1st stage cooling request, 24 VAC input switched from R	
Y2	2nd stage cooling request, 24 VAC input switched from R	Visible in the display menu when the #ClgStgs parameter is set for 2 or more, also effective for economizer free cooling supply air temperature reset when the #ClgStgs parameter is set for 1 or more
G	Continuous indoor blower request, 24 VAC input switched from R	
OCC	Occupancy request, 24 VAC input switched from R	Must have the OccMode parameter set for External to be effective
X	Hard lockout indicator, 24 volt output to a light thermostat LED	
R	24 VAC hot for thermostat switching and power	If field-added external accessories for unit shutdown are used, 24 VAC hot return from smoke detector, condensate overflow and/or user shutdown relay switching in series
SD-24	If field-added external accessories for unit shutdown are used, 24 VAC hot out for smoke detector, condensate over- flow and/or user shutdown relay switching in series	Unit wiring harness jumper plug for factory shutdown accessories must be removed if the switching of field-added external accessories for unit shutdown are wired between thermo- stat connection strip SD-24 and R
C	24 VAC common for thermostat power	
LEDs on left edge of UCB		
POWER	Green UCB power indicator	Lit indicates 24 VAC is present at C and 24V terminals
FAULT	Red hard lockout, networking error and firmware error indicator	1/2 second on/off flashing indicates one or more alarm is currently active, 1/10th second on/off flashing indicates a networking error (polarity, addressing, etc.) or a firmware error (likely correctable with re-loading from USB flash drive)
SA BUS	Green UCB SA bus communication transmission indicator	Lit/flickering indicates UCB SA bus communication is currently active, off indicates the UCB is awaiting SA bus communication
Terminal Space temperature sensor connections at center on upper edge of UCB		
ST	Space Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Positive of VDC circuit (3.625 VDC reading to COM with open circuit), effective if "Thermo- stat-only Control" parameter is set OFF, space sensor override momentary shorts ST to COM to initiate/terminate temporary occupancy
COM	Common for ST and SSO inputs	Negative of VDC circuit for ST and SSO inputs
SSO	Space Sensor Offset input from 0 to 20KΩ potentiometer	Positive of VDC circuit (3.625 VDC reading to COM with open circuit), 10KΩ/2.5 VDC is 0°F offset, 0Ω/0 VDC is maximum above offset and 20KΩ/3.4 VDC is maximum below offset from active space temperature setpoint

Table 19: Smart Equipment™ UCB Details (Continued)

Description		Function & Comments
Pin Temperature sensor connections at right on upper edge of UCB		
SAT+	Supply Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation; 3.625 VDC reading SAT+ to SAT– with open circuit. Used in heat/cool staging cutouts, free cooling operation, demand ventilation operation, comfort ventilation operation, economizer loading operation, VAV cooling operation, hydronic heat operation.
RAT+	Return Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation; 3.625 VDC reading RAT+ to RAT– with open circuit. Used in return air enthalpy calculation. Substitutes for space temperature if no other space temperature input is present.
OAT+	Outside Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation but may be a communicated value; 3.625 VDC reading OAT+ to OAT– with open circuit. Used in heat/cool cutouts, low ambient cooling determination, dry bulb free cooling changeover, outside air enthalpy calculation, economizer loading operation, heat pump demand defrost calculation.
CC1+	#1 refrigerant circuit Condenser Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for heat pump units, not required for A/C units; 3.625 VDC reading CC1+ to CC1– with open circuit. Used in heat pump demand defrost calculation.
EC1+	#1 refrigerant circuit Evaporator Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation; 3.625 VDC reading EC1+ to EC1– with open circuit. Used in suction line temperature safety.
CC2+	#2 refrigerant circuit Condenser Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for 2-compressor heat pump units, not required for 2-compressor A/C units, not active for 1-compressor units; 3.625 VDC reading CC2+ to CC2– with open circuit. Used in heat pump demand defrost calculation.
EC2+	#2 refrigerant circuit Evaporator Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation of 2-compressor units, not active for 1-compressor units; 3.625 VDC reading EC2+ to EC2– with open circuit. Used in suction line temperature safety.
Pinned connections on right edge of UCB		
RAH+	Return Air Humidity input from 0-10 VDC @ 0-100% RH sensor	Input required for reheat units, optional in all other units, may be a communicated value. Used in return air enthalpy calculation, temperature/humidity setpoint reset, reheat operation.
DCT PRS+	Supply Duct Pressure input from 0-10 VDC @ 0-5" w.c. sensor	Input required for variable air volume units. Used in VAV indoor blower operation.
DFS (upper pin)	24 VAC hot return from Dirty Filter Switch	Optional input; switch closure for greater than 15 seconds during indoor blower operation initiates a notification alarm
DFS (lower pin)	24 VAC hot out for Dirty Filter Switch	Connects through circuit trace to the R terminal
APS (upper pin)	24 VAC hot return from Air Proving Switch	When this optional input is enabled: the air proving switch must close within 30 seconds of initiation of indoor blower operation and not open for greater than 10 seconds during in- door blower operation to allow heat/cool operation and prevent an "APS open" alarm; the air proving switch must open within 30 seconds of termination of indoor blower operation to prevent an "APS stuck closed" notification alarm
APS (lower pin)	24 VAC hot out for Air Proving Switch	Connects through circuit trace to the R terminal
C	Common for the VFD output	Negative of the VDC circuit for the VFD output

Table 19: Smart Equipment™ UCB Details (Continued)

Description		Function & Comments
VFD	2-10 VDC (0-100%) output for the indoor blower Variable Frequency Drive	Output is active with indoor blower operation. For CV units: this output provides stepped IntelliSpeed control of the indoor blower VFD based on fan-only, cooling stage and heating stage outputs. For VAV units: this output provides control of the indoor blower VFD based on supply duct static pressure input and setpoint.
VFDFLT	24 VAC hot input from the normally open VFD alarm contact	The VFD alarm contact switches from R within the unit wiring harness. 24 VAC input results in unit shutdown and a "VFD fault" alarm
Terminal at lower right corner of UCB		
24V FOR OUTPUTS	24 VAC hot for H1, H2, CN-FAN, AUX HGR, FAN C1 and C2 output relay contact switching	Output relay circuitry is isolated from other UCB components and the 24 VAC hot source may be from a second transformer in the unit
Pin Heat section connections at right on lower edge of UCB		
H1	24 VAC hot output for heat section stage 1	Not effective for cooling-only units. Output if demand is present and permissions allow one stage or two stages of heat section operation
H2	24 VAC hot output for heat section stage 2	Not effective for cooling-only units or units with single-stage heat sections. Output if demand is present and permissions allow two stages of heat section operation
MV	24 VAC hot input confirming heat section operation	Sourced from gas valve in gas heat units or first stage heat contactor in electric heat units. Input within 5 minutes from initiation of H1 output initiates the "Heat On Fan Delay" timer, loss of input following the termination of H1 output initiates the "Heat On Fan Delay" timer, no input within 5 minutes from initiation of H1 output initiates an "Ignition Failure" alarm, input for longer than 5 minutes without H1 output initiates a "Gas Valve Mis-wire" alarm
Pin Cooling and fan output connections at right on lower edge of UCB		
CN-FAN	24 VAC hot output for the condenser fan contactor coil	Output with either C1 or C2 output; interrupted during defrost cycle for heat pump units
AUX HGR	24 VAC hot output for hot gas reheat components	Effective only for reheat units, output with reheat operation
FAN	24 VAC hot output for indoor blower contactor coil/indoor blower VFD enable relay coil	Output with heat/cool operation, G input or schedule demand
C1	24 VAC hot output for compressor 1	If demand is present and permissions allow compressor 1 operation; output with compressor cooling, comfort ventilation cooling, reheat or heat pump heating demands
C2	24 VAC hot output for compressor 2	Not effective for one stage compressor UCBs. If demand is present and permissions allow compressor 2 operation; output with compressor cooling, comfort ventilation cooling or heat pump heating demands
Pin Refrigerant circuit safety switch and indoor blower overload connections at center on lower edge of UCB		
HPS1 (right pin)	24 VAC hot out for refrigerant circuit 1 High Pressure Switch	Connects through circuit trace to the R terminal
HPS1 (left pin)	24 VAC hot return from refrigerant circuit 1 High Pressure Switch	Input is only considered if C1 output is needed; input must be present to allow C1 output. Three HPS1 trips in a two hour period cause a "High Pressure Switch 1 Lockout" and C1 output is then prevented until alarm reset. Connects through circuit trace to the right LPS1 pin.
LPS1 (right pin)	24 VAC hot out for refrigerant circuit 1 Low Pressure Switch	Connects through circuit trace to the left HSP1 pin

Table 19: Smart Equipment™ UCB Details (Continued)

Description		Function & Comments
LPS1 (left pin)	24 VAC hot return from refrigerant circuit 1 Low Pressure Switch	Input is only considered after 30 seconds of C1 output; afterwards, input must be present to allow C1 output. Three LPS1 trips in a one hour period cause a "Low Pressure Switch 1 Lockout" and C1 output is then prevented until alarm reset.
HPS2 (right pin)	24 VAC hot out for refrigerant circuit 2 High Pressure Switch	Not effective for one stage compressor UCBs. Connects through circuit trace to the R terminal
HPS2 (left pin)	24 VAC hot return from refrigerant circuit 2 High Pressure Switch	Not effective for one stage compressor UCBs. Input is only considered if C2 output is needed; input must be present to allow C1 output. Three HPS2 trips in a two hour period cause a "High Pressure Switch 1 Lockout" and C2 output is then prevented until alarm reset. Connects through circuit trace to the right LPS2 pin.
LPS2 (right pin)	24 VAC hot out for refrigerant circuit 2 Low Pressure Switch	Not effective for one stage compressor UCBs. Connects through circuit trace to the left HSP2 pin
LPS2 (left pin)	24 VAC hot return from refrigerant circuit 2 Low Pressure Switch	Not effective for one stage compressor UCBs. Input is only considered after 30 seconds of C2 output; afterwards, input must be present to allow C2 output. Three LPS2 trips in a one hour period cause a "Low Pressure Switch 2 Lockout" and C2 output is then prevented until alarm reset.
FAN OVR (right pin)	24 VAC hot out for indoor blower FAN Overload relay contact/motor protector switch	Connects through circuit trace to the R terminal
FAN OVR (left pin)	24 VAC hot return from indoor blower FAN Overload relay contact/motor protector switch	Input is only considered if FAN output is needed; input must be present to allow FAN output and unit operation. One FAN OVR trip lasting longer than 5 minutes or three FAN OVR trips in a two hour period cause a "Fan Overload Lockout" and unit operation is then prevented until alarm reset.
Terminal SA BUS¹ connections on at left on lower edge and center of UCB		
PWR	Power for SA ("Sensor-Actuator") BUS devices	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Positive of the 15 VDC (reading to C) circuit for powering an optional netstat and/or Multi Touch gateway
C	Common for SA BUS power and communication circuits	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Negative of the SA BUS circuits
-	Communication for SA BUS devices	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts lower than +) SA BUS communication circuit to optional economizer board, 4-stage board, fault detection & diagnostics board, netstat and/or Multi Touch gateway
+	Communication for SA BUS devices	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts higher than -) SA BUS communication circuit to optional economizer board, 4-stage board, fault detection & diagnostics board, netstat and/or Multi Touch gateway
J8	6-pin phone jack connector	Incorporates the SA BUS terminals for convenience/alternate connection of SA BUS devices, primarily used for temporary service connection of the Multi Touch gateway
Item Integrated user interface at lower left corner of UCB		
Display	On-board, 2-line x 8-character back-lit display	On-board display, buttons and joystick allow access to UCB, economizer, 4-stage and FDD board parameters

Table 19: Smart Equipment™ UCB Details (Continued)

Description		Function & Comments
ENTER	Button for display menu acknowledgment and navigation	
CANCEL	Button for display menu navigation and zeroing of active compressor ASCD timer	
JOY	4-way Joystick for display menu navigation	
Item USB connector at right of UCB		
J10	Type A female Universal Serial Bus connector	Used for backup, restoration, & copying of board parameters as well as board software updating through a flash drive
J15	Factory wired SA Bus connector	
Optional communication sub-board at center of UCB		
Terminal FC BUS¹ connections on left edge of the communication board		
FC+	FC ("Field Connected") BUS BACnet MSTP communication	Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to COM; at least 0.25 volts higher than –) FC bus BACnet MSTP communication circuit
FC–	FC ("Field Connected") BUS BACnet MSTP communication	Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to COM; at least 0.25 volts lower than +) FC bus BACnet MSTP communication circuit
COM	Common for the FC ("Field Connected") BUS BACnet MSTP communication circuit	Negative of the VDC FC bus BACnet MSTP communication circuit
SHLD	Shield for the FC ("Field Connected") BUS BACnet MSTP communication circuit	Earth ground reference of the cable to prevent interference on the FC bus BACnet MSTP communication circuit
Item Selector in red housing at left on top edge of the communication board		
EOL switch	End Of Line selector switch for the FC BUS BACnet MSTP communication circuit	ON selected only for the UCB that is the terminus of the FC bus BACnet MSTP communication cable to prevent signal "bounce-back"
LEDs on the communication board		
EOL	Green End Of Line indicator	Lit indicates the EOL switch is selected ON
FC BUS	Green FC bus communication transmission indicator	Lit/flickering indicates outgoing UCB FC bus communication is currently active, off indicates the UCB is awaiting incoming FC bus communication
ISO PWR	Green communication board Isolated Power indicator	Lit indicates the UCB is supplying power to the communication sub-board

1. When wiring unit and other devices using the SA Bus and FC Bus, see Table 21.

Operation

Compressor Operation

Compressor Operation details include:

- Compressors are controlled by the Y1 through Y2 thermostat inputs. If the Lead/Lag function is turned OFF, a Y1 input energizes the C1 output when the compressor number 1 anti-short cycle delay is at 0 and all refrigerant safety devices are closed (Default 5 minutes).
- The FAN output for indoor fan operation energizes with any cooling output after the Indoor Fan Cool On Delay expires.

- When the thermostat cooling inputs are lost **and** the minimum runtime expires, the compressor outputs stage off (Default 3 minutes).

- A 30 second interstage delay occurs when multiple stages are requested.

NOTE: A Y2 input without a Y1 input energizes a C1 first and then C2 30 seconds later.

Economizer Sequences

Several functions can drive the economizer, including: minimum position, free cooling, economizer loading, and minimum outdoor air supply.

Economizer Minimum Position

The economizer minimum position is set during occupied mode when outside air is not suitable for free cooling. The position of the damper is set proportionally between the "Economizer Minimum Position and the Economizer Minimum Position Low Speed Fan" set points. On a constant volume single speed supply fan system both set-points should be set to the same value.

Free Cooling

Four types of free cooling options are available: dry bulb changeover, single enthalpy, dual enthalpy changeover, and Auto.

Dry Bulb Changeover

For dry bulb economizer operation, the outside air is suitable for free cooling if the outside air temperature is 1°F below the Economizer OAT Enable Setpoint **and** 1°F below the Return Air Temperature.

Free cooling is no longer available if the outside air temperature rises above **either** the Economizer OAT Enable setpoint **or** the return air temperature.

Single Enthalpy Changeover

For single enthalpy economizer operation, the outside air is suitable for free cooling if the outside air enthalpy is at least 1 BTU/lb below the Economizer Outside Air Enthalpy Setpoint **and** the outside air temperature is no greater than the RAT plus 9°F.

If the outside air temperature rises above the RAT plus 10°F, free cooling is no longer available. The outside air temperature must drop to no greater than RAT plus 9°F to enter free cooling again.

Free cooling is no longer available if the outside air enthalpy rises above the Economizer Outside Air Enthalpy Setpoint.

Dual Enthalpy Changeover

For dual enthalpy economizer operation, the outside air enthalpy must be lower than the return air enthalpy by 1 btu/lb **AND** the outside air temperature is no greater than the RAT plus 9°F.

Auto

The control determines the type of free cooling changeover based on which sensors are present and reliable. Conditions include:

- Return and outside air dry bulb = dry bulb changeover
- Return and outside air dry bulb and outside air humidity = single enthalpy

- Return and outside air dry bulb and return and outside air humidity = dual enthalpy
- If either the return or outside air dry bulb sensors are unreliable, free cooling is not available

Free Cooling Operation

When the control determines that the outside air is suitable, the first stage of cooling will always be free cooling.

Thermostat

In free cooling, with a thermostat input to Y1, the dampers modulate to control the supply air temperature to the Economizer Setpoint +/- 1°F (default 55°F).

If the thermostat provides an input to Y2 **and** the parameter Compressors Off in Free Cooling is turned OFF a compressor output energizes. The economizer dampers continue to modulate to control the supply air temperature to the Economizer Setpoint.

If the supply air temperature cannot be maintained within 5°F of the economizer setpoint, the first stage compressor (C1) will be turned on.

Sensor

In free cooling, with a demand from the zone/return sensor for the first stage of cooling, the dampers modulate to control the supply air temperature to the Economizer Setpoint +/- 1°F.

If the economizer output is at 100% **and** the SAT is greater than the Economizer setpoint + 1°F, the control starts a 12-minute timer to energize a compressor output.

If at any time the economizer output drops below 100% the timer stops and resets when the economizer output returns to 100%.

Once a compressor output is turned ON, the economizer dampers continue to modulate to control the supply air temperature to the Economizer Setpoint.

At no time will a compressor output be turned ON if the economizer output is less than 100%, even if the differential between zone (or return) temperature and the current cooling setpoint is great enough to demand more than one stage of cooling.

If the economizer output goes to minimum position **and** the SAT is less than Economizer Setpoint -1°F, the control starts a 12-minute timer to de-energize a compressor output.

If at any time the economizer output goes above the minimum position the timer stops and resets when the economizer output returns to minimum position.

If the demand for cooling from the space/return is satisfied, the economizer output will modulate to minimum position and the compressor outputs will be de-energized as long as their minimum run timers have expired.

Economizer Loading

Power Exhaust

Setpoints

- | | |
|--------------------------------------|-------------|
| a. Economizer Enable | ON |
| b. Power Exhaust Enable | ON |
| c. Modulating Power Exhaust | OFF |
| d. Exhaust VFD Installed | OFF |
| e. Building Pressure Sensor Enabled | OFF |
| f. Econo Damper Position For Exh Fan | ON Percent |
| g. Econo Damper Position For Exh Fan | OFF Percent |

Inputs

No inputs are present for non-modulating power exhaust.

Outputs

- a. 2-10 VDC from ECON on Economizer Expansion module
- b. 24 VAC from EX-FAN to energize exhaust fan on Economizer Expansion module

Operation

Operation details include:

- a. Compares economizer output to the Economizer Damper Position For Exhaust Fan On and OFF.
- b. Energizes exhaust fan when economizer output is above Economizer Damper Position For Exhaust Fan On.
- c. De-energizes exhaust fan when economizer output is below the Economizer Damper Position for Exhaust Fan OFF

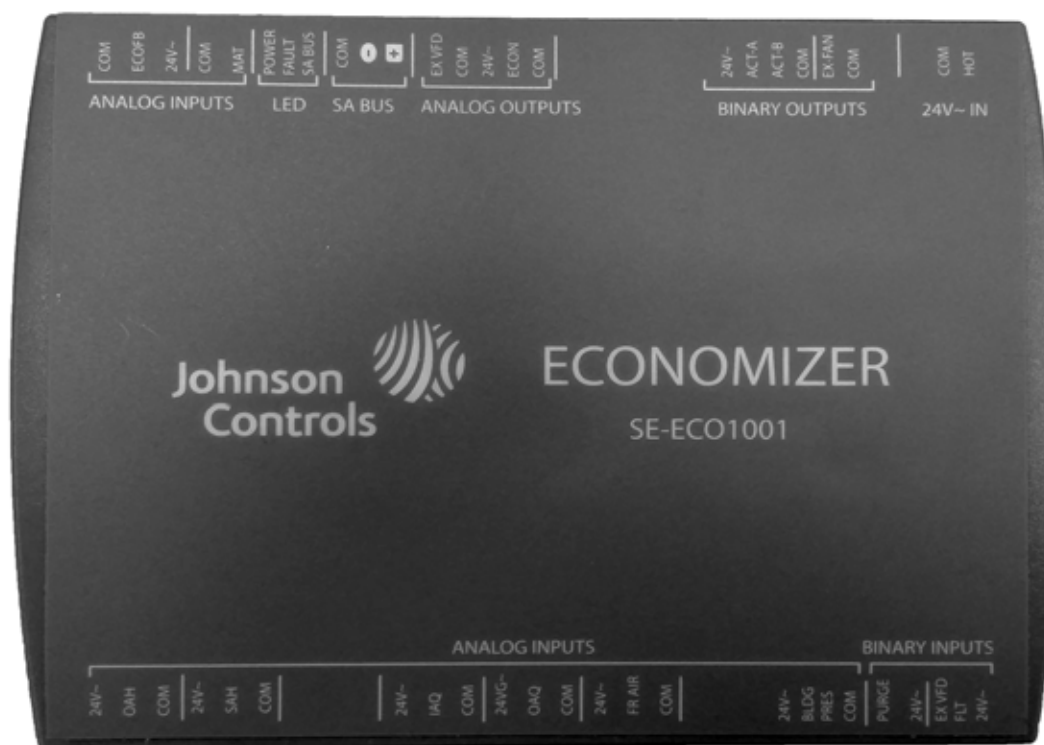


Figure 23: SE-ECO1001-1 Economizer Controller

Table 20: Smart Equipment™ Economizer Board Details

Board Label	Cover Label	Description	Function & Comments
Directional orientation: viewed with the center text of the cover label upright			
ANALOG INPUTS Terminal at left on upper edge of economizer board			
C	COM	24 VAC common/0-10 VDC negative for economizer actuator position feedback	Connects through circuit trace to 24V~ IN pin COM
IN2	ECOFB	0-10 VDC positive input from Economizer actuator position Feedback	EconDampPos parameter reports input status (0-100%). Used to meet Cali. Title 24 requirements for economizer actuator position feedback
R	24V~	24 VAC hot supplied for economizer actuator position feedback	Connects through circuit trace to 24V~ IN pin HOT
C	COM	Mixed Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	MAT parameter reports input status (°F/°C), 3.65 VDC reading MAT (+) to COM (-) with open circuit. Read-only use in current control revision.
IN1	MAT		
LEDs at left on upper edge of economizer board			
POWER	POWER	Green UCB power indicator	Lit indicates 24 VAC is present at 24V~ IN COM and HOT pins
FAULT	FAULT	Red networking error and firmware error indicator	1/10th second on/off flashing indicates a networking error (polarity, addressing, etc.) or a firmware error (likely correctable with re-loading from USB flash drive)
SA BUS	SA BUS	Green UCB SA bus communication transmission indicator	Lit/flickering indicates UCB-to-economizer board SA bus communication is currently active, off indicates the economizer board is awaiting SA bus communication
SA BUS Pin connections at left on upper edge of economizer board¹			
C	COM	Common for SA BUS power and communication circuits	EconCtrlr parameter reports UCB-to-economizer board SA bus communication status. Negative of the SA BUS communication circuit to the UCB. Through the unit wiring harness, may continue on to the 4-stage board and/or fault detection & diagnostics board

Table 20: Smart Equipment™ Economizer Board Details (Continued)

Board Label	Cover Label	Description	Function & Comments
-	-	Communication for SA BUS devices	EconCtrlr parameter reports UCB-to-economizer board SA BUS communication status. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts lower than +) SA BUS communication circuit to the UCB. Through the unit wiring harness, may continue on to the 4-stage board and/or fault detection & diagnostics board
+	+	Communication for SA BUS devices	EconCtrlr parameter reports UCB-to-economizer board SA BUS communication status. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts higher than -) SA BUS communication circuit to the UCB. Through the unit wiring harness, may continue on to the 4-stage board and/or fault detection & diagnostics board
ANALOG OUTPUTS Pin at center on upper edge of economizer board			
J4	EX VFD	2-10 VDC positive output for the modulating power Exhaust fan Variable Frequency Drive/ discharge damper modulating power exhaust actuator	ExFanVFD parameter reports output status (0-100%) when ExFType selection is Variable Frequency Fan; EAD-O parameter reports output status (0-100%) when ExFType selection is Modulating Damper. Used to ramp the power exhaust fan VFD/ position the discharge damper actuator.
	COM	24 VAC common/0-10 VDC negative for the power exhaust variable frequency drive/ discharge damper modulating power exhaust actuator	Connects through circuit trace to 24V~ IN pin COM
	24V~	24 VAC hot supplied for the discharge damper modulating power exhaust actuator and economizer actuator	Connects through circuit trace to 24V~ IN pin HOT
	ECON	2-10 VDC output for the Economizer actuator	Econ parameter reports output status (0-100%). Used to position the economizer actuator for minimum position, free cooling, demand ventilation, cooling economizer loading and purge functions
	COM	24 VAC common/0-10 VDC negative for economizer actuator	Connects through circuit trace to 24V~ IN pin COM
BINARY OUTPUTS Pin at right on upper edge of economizer board			
J3	24V~	24 VAC hot supplied for an incremental (floating control) economizer actuator	Connects through circuit trace to 24V~ IN pin HOT
	ACT-A	24 VAC hot outputs to position an incremental (floating control) economizer actuator	Unused in current control revision
	ACT-B	24 VAC return	Unused in current control revision
	COM	24 VAC common for an incremental (floating control) economizer actuator	Connects through circuit trace to 24V~ IN pin COM
	EX-FAN	24 VAC hot output to energize power exhaust fan contactor coil/VFD enable relay coil	ExFan parameter reports output status (Off-On) when ExFType selection is Non-Modulating, Modulating Damper or Variable Frequency Fan. Used to turn on/enable the power exhaust fan motor.
	COM	24 VAC common/0-10 VDC negative for economizer actuator	Connects through circuit trace to 24V~ IN pin COM
24V~ IN Pin connections at right on upper edge of economizer board			
C	COM	24 VAC transformer Common referenced to cabinet ground	24 VAC common connection to power the economizer board. Connects through circuit traces to C/COM terminals and pins distributed on the economizer board.

Table 20: Smart Equipment™ Economizer Board Details (Continued)

Board Label	Cover Label	Description	Function & Comments
R	HOT	24 VAC transformer HOT	24 VAC hot connection to power the economizer board. Connects through circuit traces to R/24V~ terminals and pins distributed on the economizer board.
ANALOG INPUTS Terminal on lower edge of economizer board			
R	24V~	24 VAC hot supplied for the outdoor air humidity sensor	Connects through circuit trace to 24V~ IN pin HOT
IN3	OAH	0-10 VDC positive input from the Outdoor Air Humidity sensor	OAH parameter reports input status (0-100%H). Used in outdoor air enthalpy calculation for dual enthalpy economizer free cooling changeover.
C	COM	24 VAC common/0-10 VDC negative for the outdoor air humidity sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the supply air humidity sensor	Connects through circuit trace to 24V~ IN pin HOT
IN4	SAH	0-10 VDC positive input from the Supply Air Humidity sensor	SAH parameter reports input status (0-100%H). Unused in current control revision.
C	COM	24 VAC common/0-10 VDC negative for the supply air humidity sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the indoor air quality sensor	Connects through circuit trace to 24V~ IN pin HOT
IN5	IAQ	0-10 VDC positive input from the Indoor Air Quality sensor	IAQRange parameter sets the CO2 parts per million measured by the indoor air quality sensor when it outputs 10 VDC; IAQ parameter reports input status (0-5000ppm). Used for demand ventilation functions if the NetIAQ parameter indicates ?Unrel.
C	COM	24 VAC common/0-10 VDC negative for the indoor air quality sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the outdoor air quality sensor	Connects through circuit trace to 24V~ IN pin HOT
IN6	OAQ	0-10 VDC positive input from the Outdoor Air Quality sensor	OAQRange parameter sets the CO2 parts per million measured by the outdoor air quality sensor when it outputs 10 VDC; OAQ parameter reports input status (0-5000ppm). Used for demand ventilation function when DVent-Mode selection is Diff between IAQ and OAQ and the NetOAQ parameter indicates ?Unrel.
C	COM	24 VAC common/0-10 VDC negative for the outdoor air quality sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the air monitoring station sensor	Connects through circuit trace to 24V~ IN pin HOT
IN7	FR AIR	0-10 VDC positive input from the air monitoring station sensor	MOA-Range parameter sets the cubic feet per minute/liters per second measured by the air monitoring station sensor when it outputs 10 VDC; Fr Air parameter reports input status (0-50000CFM/23595lps). Used for economizer minimum position reset in speed-controlled indoor blower applications.
C	COM	24 VAC common/0-10 VDC negative for the air monitoring station sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the building pressure sensor	Connects through circuit trace to 24V~ IN pin HOT
IN8	BLDG PRES	0-5 VDC positive input from the Building Pressure sensor	BldgPres parameter reports input status (-.250-.250"/w/-.062-.062kPa). Used for modulating power exhaust functions when ExFType selection is Modulating Damper or Variable Frequency Fan.

Table 20: Smart Equipment™ Economizer Board Details (Continued)

Board Label	Cover Label	Description	Function & Comments
C	COM	24 VAC common/0-5 VDC negative for the building pressure sensor	Connects through circuit trace to 24V~ IN pin COM
BINARY INPUTS at right on lower edge of economizer board			
IN9	PURGE	24 VAC hot input from the PURGE dry contact	Purge parameter reports input status (False with 0 VAC input-True with 24 VAC input). When Purge status is True, heating and cooling operation is prevented, the indoor blower and power exhaust fan operate, the economizer actuator is positioned to 100%.
	24V~	24 VAC hot supplied for the purge dry contact	Connects through circuit trace to 24V~ IN pin HOT
IN10	EX VFD FLT	24 VAC hot input from the power Exhaust Variable Frequency Drive Fault contact	ExFanVFDFlt parameter reports input status (Normal with 0 VAC input-Alarm with 24 VAC input) when ExFType selection is Variable Frequency Fan. When ExFanVFDFlt status is Alarm, EX-FAN fan output is prevented.
	24V~	24 VAC hot supplied for the power exhaust variable frequency drive fault contact	Connects through circuit trace to 24V~ IN pin HOT

1. When wiring unit and other devices using the SA Bus and FC Bus, see Table 21.

Table 21: Cable for FC Buses and SA Buses in Order of Preference

Bus and Cable Type	Non-Plenum Applications		Plenum Applications	
	Part Number	O.D.	Part Number	O.D.
FC Bus: 22 AWG Stranded, 3-Wire Twisted Shielded Cable ¹	Anixter: CBL-22/3-FC-PVC Belden®: B5501FE	0.138 in.	Anixter: CBL-22/3-FC-PLN Belden: B6501FE	0.140 in.
SA Bus (Terminal Block): 22 AWG Stranded, 4-Wire, 2 Twisted-Pair Shielded Cable	Anixter: CBL-22/2P-SA-PVC Belden: B5541FE	0.209 in.	Anixter: CBL-22/2P-SA-PLN Belden: B6541FE	0.206 in.
SA Bus (Modular Jack): 26 AWG Solid 6-Wire, 3 Twisted-Pair Cable ²	—	—	Anixter preassembled: CBL-NETWORK25 CBL-NETWORK50 CBL-NETWORK75 CBL-NETWORK100	0.15 in.
FC Bus: 22 AWG Stranded, 3-Wire Twisted Non-Shielded Cable	Belden: B5501UE	0.135 in.	Belden: B6501UE	0.131 in.
SA Bus (Terminal Block): 22 AWG Stranded, 4-Wire, 2 Twisted-Pair Non-Shielded Cable	Belden: B5541UE	0.206 in.	Belden: B6541UE	0.199 in.

1. We strongly recommend 3-wire (for FC bus) and 4-wire, 2 twisted-pair (for SA bus), 22 AWG stranded, shielded cable. A 22 gauge cable offers the best performance for various baud rates, cable distances, and number of trunk devices primarily due to lower conductor-to-conductor capacitance. Shielded cable offers better overall electrical noise immunity than non-shielded cable. Observe the shield grounding requirements.
2. We recommend 26 AWG solid, 6-wire (3 twisted pairs) cable as the best fit for fabricating modular cables with the modular jack housing assembly. Be sure the cable you use fits the modular jack housing. The preassembled cables that are available from Anixter (Part No. CBL-NETWORKxxx) use 24 gauge wire.

Start-Up

Prestart Check List

After installation has been completed:

1. Check the electrical supply voltage being supplied. Be sure that it is the same as listed on the unit nameplate.
2. Set the room thermostat to the off position.
3. Turn unit electrical power on.
4. Set the room thermostat fan switch to on.
5. Check indoor blower rotation.
 - If blower rotation is in the wrong direction. Refer to Phasing Section in general information section.
 Check blower drive belt tension.
6. Check the unit supply air (CFM).
7. Measure evaporator fan motor's amp draw.
8. Set the room thermostat fan switch to off.
9. Turn unit electrical power off.

Operating Instructions

1. Turn unit electrical power on.

NOTE: Prior to each cooling season, the crankcase heaters must be energized at least 10 hours before the system is put into operation.

2. Set the room thermostat setting to lower than the room temperature.
3. First stage compressors will energize after the built-in time delay (five minutes).

Post Start Check List

1. Verify proper system pressures.
2. Measure the temperature drop across the evaporator coil.

Troubleshooting

WARNING

Troubleshooting of components may require opening the electrical control box with the power connected to the unit. **Use extreme care when working with live circuits!** Check the unit nameplate for the correct line voltage and set the voltmeter to the correct range before making any connections with line terminals.

When not necessary, shut off all electric power to the unit prior to any of the following maintenance procedures so as to prevent personal injury.

CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation, which could cause injury to person and/or damage unit components. Verify proper operation after servicing.

Table 22: XXA7 Charging Table

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Discharge PSI	Liquid Temp (F)	Delta T Dry Bulb	Compr Amps
300 Cfm/Ton 80/62	75	124	54	311	79	30	11.9
	85	128	55	359	89	29	13.2
	95	132	56	413	99	27	15.1
300 Cfm/Ton 80/67	75	136	59	319	80	25	12.1
	85	140	60	369	90	24	13.7
	95	144	61	423	100	22	15.4
300 Cfm/Ton 80/72	75	148	65	331	82	20	12.6
	85	152	65	377	91	19	13.8
	95	156	66	433	101	17	15.7
300 Cfm/Ton 75/62	75	124	54	311	79	25	11.9
	85	127	55	360	89	24	13.4
	95	132	56	413	99	22	15.1
400 Cfm/Ton 80/62	75	131	58	319	80	27	12.0
	85	135	58	364	90	25	13.4
	95	141	59	420	100	24	15.3
400 Cfm/Ton 80/67	75	141	62	327	81	22	12.3
	85	146	62	375	91	21	13.8
	95	149	63	427	101	20	15.4
400 Cfm/Ton 80/72	75	155	68	335	82	16	12.5
	85	159	67	386	92	16	14.0
	95	162	68	437	102	15	15.6
400 Cfm/Ton 75/62	75	131	56	316	79	22	11.9
	85	134	57	364	90	21	13.4
	95	138	58	417	99	20	15.2

Table 23: XX08 Charging Table System 1

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Discharge PSI	Liquid Temp (F)	Delta T Dry Bulb	Compr Amps
300 Cfm/Ton 80/62	75	125	51	289	79	32	7.4
	85	127	54	333	88	31	8.3
	95	130	58	381	98	30	9.4
300 Cfm/Ton 0/67	75	137	58	296	79	27	7.5
	85	140	60	340	89	25	8.5
	95	143	62	388	98	24	9.6
300 Cfm/Ton 80/72	75	149	64	304	80	21	7.6
	85	152	65	348	90	20	8.6
	95	155	67	396	99	19	9.7
300 Cfm/Ton 75/62	75	125	53	291	78	27	7.4
	85	128	55	334	88	26	8.4
	95	131	58	382	98	24	9.6
400 Cfm/Ton 80/62	75	133	57	294	79	28	7.5
	85	135	60	338	88	27	8.4
	95	138	63	385	98	26	9.5
400 Cfm/Ton 80/67	75	145	60	301	80	23	7.6
	85	147	62	344	90	22	8.5
	95	150	64	392	99	21	9.6
400 Cfm/Ton 80/72	75	157	66	307	81	18	7.7
	85	160	68	352	91	17	8.7
	95	163	69	400	100	16	9.7
400 Cfm/Ton 75/62	75	133	54	294	79	23	7.5
	85	135	58	337	88	22	8.4
	95	137	61	385	98	21	9.5

Table 24: XX08 Charging Table System 2

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Discharge PSI	Liquid Temp (F)	Delta T Dry Bulb	Compr Amps
300 Cfm/Ton 80/62	75	123	56	294	77	32	7.3
	85	127	58	335	87	31	8.4
	95	131	60	388	97	30	9.4
300 Cfm/Ton 80/67	75	135	60	300	78	27	7.5
	85	140	62	346	88	25	8.5
	95	144	64	395	98	24	9.7
300 Cfm/Ton 80/72	75	147	64	306	80	21	7.6
	85	152	66	352	90	20	8.5
	95	156	68	401	99	19	9.7
300 Cfm/Ton 75/62	75	124	55	294	78	27	7.5
	85	128	58	340	87	26	8.4
	95	132	60	389	97	24	9.6
400 Cfm/Ton 80/62	75	130	56	297	78	28	7.5
	85	134	59	344	88	27	8.5
	95	139	61	392	98	26	9.6
400 Cfm/Ton 80/67	75	143	61	305	79	23	7.6
	85	147	62	350	89	22	8.5
	95	151	65	398	98	21	9.6
400 Cfm/Ton 80/72	75	155	65	310	90	18	7.7
	85	159	67	356	90	17	8.6
	95	163	69	406	100	16	9.7
400 Cfm/Ton 75/62	75	131	56	298	78	23	7.6
	85	134	52	342	88	22	8.5
	95	138	60	392	98	21	9.5

Table 25: XX09 Charging Table System 1

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Liquid PSI	Liquid Temp (F)	Delta T Dry Bulb	Compr Amps
300 Cfm/Ton 80/62	75	122	61	287	81	30	8.3
	85	125	63	330	91	29	9.2
	95	128	65	375	101	28	10.3
300 Cfm/Ton 80/67	75	132	64	293	81	26	8.3
	85	137	66	335	91	25	9.2
	95	141	68	382	101	24	10.3
300 Cfm/Ton 80/72	75	143	67	299	82	21	8.5
	85	148	69	344	92	20	9.4
	95	152	70	390	102	19	10.5
300 Cfm/Ton 75/62	75	123	60	288	81	26	8.3
	85	126	62	329	91	25	9.2
	95	129	64	376	101	24	10.3
400 Cfm/Ton 80/62	75	128	62	292	81	26	8.3
	85	132	65	335	91	25	9.3
	95	136	67	382	101	24	10.4
400 Cfm/Ton 80/67	75	140	66	299	81	22	8.4
	85	144	67	341	91	21	9.3
	95	148	68	388	102	21	10.4
400 Cfm/Ton 80/72	75	152	69	305	82	17	8.5
	85	155	70	348	92	17	9.4
	95	159	72	395	102	16	10.5
400 Cfm/Ton 75/62	75	128	61	290	81	22	8.2
	85	132	63	333	91	22	9.2
	95	136	65	380	101	20	10.3

Table 26: XX09 Charging Table System 2

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Liquid PSI	Liquid Temp (F)	Delta T Dry Bulb	Compr Amps
300 Cfm/Ton 80/62	75	123	55	290	79	30	8.3
	85	127	57	336	90	29	9.2
	95	131	59	384	100	28	10.3
300 Cfm/Ton 80/67	75	135	60	297	80	26	8.3
	85	139	61	341	90	25	9.2
	95	144	63	390	100	24	10.4
300 Cfm/Ton 80/72	75	146	64	303	81	21	8.5
	85	151	66	348	91	20	9.4
	95	156	67	397	101	19	10.5
300 Cfm/Ton 75/62	75	124	54	292	80	26	8.3
	85	128	56	336	89	25	9.2
	95	132	58	384	100	24	10.4
400 Cfm/Ton 80/62	75	130	58	295	80	26	8.3
	85	133	59	340	90	25	9.3
	95	138	61	389	100	24	10.4
400 Cfm/Ton 80/67	75	142	63	301	81	22	8.4
	85	146	63	346	90	21	9.3
	95	150	65	394	100	21	10.5
400 Cfm/Ton 80/72	75	154	66	308	81	17	8.5
	85	159	67	353	92	17	9.4
	95	163	68	402	101	16	10.5
400 Cfm/Ton 75/62	75	130	57	294	79	22	8.2
	85	133	58	338	89	22	9.2
	95	137	60	387	100	20	10.3

Table 27: XX12 Charging Table System 1

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Liquid PSI	Liquid Temp (F)	Delta T Dry Bulb	Compressor Amps
300 Cfm/Ton 80/62	75	121	59	293	79	30	10.1
	85	123	61	335	89	29	11.2
	95	126	62	383	99	28	12.5
300 Cfm/Ton 80/67	75	132	63	298	80	25	10.2
	85	135	64	344	91	24	11.4
	95	138	66	392	101	23	12.8
300 Cfm/Ton 80/72	75	141	73	303	80	20	10.2
	85	146	72	351	91	19	11.3
	95	149	70	402	102	18	13.0
300 Cfm/Ton 75/62	75	121	58	291	79	25	9.9
	85	123	60	338	90	24	11.1
	95	125	61	385	100	23	12.5
400 Cfm/Ton 80/62	75	127	62	294	80	26	9.9
	85	130	63	342	91	25	11.3
	95	131	65	388	100	24	12.7
400 Cfm/Ton 80/67	75	138	68	300	80	22	10.2
	85	142	66	351	91	21	11.4
	95	144	68	397	101	20	12.9
400 Cfm/Ton 80/72	75	145	75	305	79	16	10.3
	85	153	74	358	92	16	11.6
	95	155	72	407	102	15	13.0
400 Cfm/Ton 75/62	75	128	60	296	80	22	10.0
	85	130	61	340	91	21	11.2
	95	132	63	389	101	20	12.8

Table 28: XX12 Charging Table System 2

Indoor Airflow Db/Wb	Outdoor DB	Suction PSI	Suction Temp (F)	Liquid PSI	Liquid Temp (F)	Delta T Dry Bulb	Compressor Amps
300 Cfm/Ton 80/62	75	123	60	284	79	30	9.6
	85	127	62	326	89	29	10.6
	95	130	63	373	99	28	11.8
300 Cfm/Ton 80/67	75	133	64	290	80	25	9.6
	85	137	64	336	91	24	10.7
	95	141	66	384	101	23	12.1
300 Cfm/Ton 80/72	75	142	73	296	80	20	9.7
	85	148	73	343	91	19	10.7
	95	153	71	392	102	18	12.2
300 Cfm/Ton 75/62	75	123	59	283	79	25	9.4
	85	126	60	330	90	24	10.5
	95	129	62	378	100	23	11.8
400 Cfm/Ton 80/62	75	129	63	287	80	26	9.4
	85	133	64	335	91	25	10.7
	95	137	66	381	100	24	12.0
400 Cfm/Ton 80/67	75	139	69	291	80	22	9.7
	85	145	66	341	91	21	10.8
	95	149	68	388	101	20	12.1
400 Cfm/Ton 80/72	75	146	75	297	79	16	9.7
	85	156	74	348	92	16	10.9
	95	160	72	397	102	15	12.2
400 Cfm/Ton 75/62	75	130	61	288	80	22	9.5
	85	134	61	333	91	21	10.6
	95	137	63	381	101	20	12.0

Start-Up Sheet**START-UP & SERVICE DATA INSTRUCTION****COMMERCIAL PACKAGE UNITS****3.0 To 40.0 TONS****START-UP CHECKLIST**

Date: _____

Job Name: _____

Customer Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Model Number: _____ Serial Number: _____

Qualified Start-up Technician: _____ Signature: _____

HVAC Contractor: _____ Phone: _____

Address: _____

Contractor's E-mail Address: _____

Electrical Contractor: _____ Phone: _____

Distributor Name: _____ Phone: _____

WARRANTY STATEMENT

Johnson Controls/Ducted Systems is confident that this equipment will operate to the owner's satisfaction if the proper procedures are followed and checks are made at initial start-up. This confidence is supported by the 30 day dealer protection coverage portion of our standard warranty policy which states that Johnson Controls/Ducted Systems will cover parts and labor on new equipment start-up failures that are caused by a defect in factory workmanship or material, for a period of 30 days from installation. Refer to the current standard warranty policy and warranty manual for details.

In the event that communication with Johnson Controls/Ducted Systems is required regarding technical and/or warranty concerns, all parties to the discussion should have a copy of the equipment start-up sheet for reference. A copy of the original start-up sheet should be filed with the Technical Services Department.

The packaged unit is available in constant or variable air volume versions with a large variety of custom options and accessories available. Therefore, some variation in the startup procedure will exist depending upon the products capacity, control system, options and accessories installed.

This start-up sheet covers all startup check points common to all package equipment. In addition it covers essential startup check points for a number of common installation options. Depending upon the particular unit being started not all sections of this startup sheet will apply. Complete those sections applicable and use the notes section to record any additional information pertinent to your particular installation.

Warranty claims are to be made through the distributor from whom the equipment was purchased.

EQUIPMENT STARTUP

Use the local LCD or Mobile Access Portal (MAP) Gateway to complete the start-up.

A copy of the completed start-up sheet should be kept on file by the distributor providing the equipment and a copy sent to:

Johnson Controls/Ducted Systems
Technical Services Department
5005 York Drive
Norman, OK 73069

1034349-UCL-F-0318

SAFETY WARNINGS

The inspections and recording of data outlined in this procedure are required for start-up of Johnson Controls/Ducted Systems' packaged products. Industry recognized safety standards and practices must be observed at all times. General industry knowledge and experience are required to assure technician safety. It is the responsibility of the technician to assess all potential dangers and take all steps warranted to perform the work in a safe manner. By addressing those potential dangers, prior to beginning any work, the technician can perform the work in a safe manner with minimal risk of injury.

WARNING

Lethal voltages are present during some start-up checks. Extreme caution must be used at all times.

WARNING

Moving parts may be exposed during some startup checks. Extreme caution must be used at all times.

NOTE: Read and review this entire document before beginning any of the startup procedures.

DESIGN APPLICATION INFORMATION

This information will be available from the specifying engineer who selected the equipment. If the system is a VAV system the CFM will be the airflow when the remote VAV boxes are in the

full open position and the frequency drive is operating at 60 HZ.
Do not proceed with the equipment start-up without the design CFM information.

Design Supply Air CFM: _____ Design Return Air CFM: _____

Design Outdoor Air CFM At Minimum Position: _____

Total External Static Pressure: _____

Supply Static Pressure: _____

Return Static Pressure: _____

Design Building Static Pressure: _____

Outside Air Dilution: Economizer Position Percentage: _____ CFM: _____

Supply Gas Pressure After Regulator W/o Heat Active _____ Inches _____

ADDITIONAL APPLICATION NOTES FROM SPECIFYING ENGINEER:

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REFERENCE

General Inspection	Completed	See Notes
Unit inspected for shipping, storage, or rigging damage	☐	☐
Unit installed with proper clearances	☐	☐
Unit installed within slope limitations	☐	☐
Refrigeration system checked for gross leaks (presence of oil)	☐	☐
Terminal screws and wiring connections checked for tightness	☐	☐
Filters installed correctly and clean	☐	☐
Economizer hoods installed in operating position	☐	☐
Condensate drain trapped properly, refer to Installation Manual	☐	☐
Economizer damper linkage tight	☐	☐
Gas Heat vent hood installed	☐	☐
All field wiring (power and control) complete	☐	☐

Air Moving Inspection	Completed	See Notes
Alignment of drive components	☐	☐
Belt tension adjusted properly	☐	☐
Blower pulleys tight on shaft, bearing set screws tight, wheel tight to shaft	☐	☐
Pressure switch or transducer tubing installed properly	☐	☐

Exhaust Inspection Powered ☐ Barometric Relief ☐	Completed	See Notes
Check hub for tightness	☐	☐
Check fan blade for clearance	☐	☐
Check for proper rotation	☐	☐
Check for proper mounting (screen faces towards unit)	☐	☐
Prove operation by increasing minimum setting on economizer	☐	☐

Economizer Inspection Standard ☐ BAS ☐	Completed	See Notes
CO ₂ sensor installed Yes ☐ No ☐	☐	☐
Check economizer setting (Reference Smart Equipment™ Control Board LCD menu location)	☐	☐
Prove economizer open/close through Smart Equipment™ Board Setting	☐	☐

Reheat Mode Normal ☐ or Alternate ☐ Not Applicable ☐
Humidity Sensor (2SH0401) _____

Ducted Systems

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Operating Measurements - Air Flow

Fan operates with proper rotation (All VFD equipped units with the optional Manual Bypass must be phased for correct blower rotation with the Bypass switch set in the LINE position)			ID Fans ☐	Exh. Fans ☐	Cond. Fans ☐
Pressure drop across dry evaporator coil (At maximum design CFM) ¹					IWC
External Static Pressure					IWC
Return Static Pressure					IWC
Supply Static Pressure					IWC
Supply Air CFM Using Dry Coil Chart					CFM
Final Adjusted Supply Air CFM ²					CFM

1. Consult the proper airflow to pressure drop table to obtain the actual airflow at the measured pressure differential.
2. Was a motor pulley adjustment or change required to obtain the correct airflow?
Was it necessary to increase or decrease the airflow to meet the design conditions?
If the motor pulley size was changed, measure the outside diameters of the motor and blower pulleys and record those diameters here;

Blower Motor HP _____ FLA _____ RPM _____

Pulley Pitch Diameter _____ Turns Out _____ Final Turns Out _____

Blower Pulley Pitch Diameter _____ Fixed Sheave _____

ELECTRICAL DATA

T1 - T2 _____ Volts T2 - T3 _____ Volts
Control Voltage _____ Volts T1 - T3 _____ Volts

Device	Nameplate	Measured List All Three Amperages
Supply Fan Motor ^{1, 2}	AMPS	AMPS
Exhaust Motor (Dampers 100%)	AMPS	AMPS
Condenser Fan #1	AMPS	AMPS
Condenser Fan #2 (if equipped)	AMPS	AMPS
Condenser Fan #3 (if equipped)	AMPS	AMPS
Condenser Fan #4 (if equipped)	AMPS	AMPS
Compressor #1	AMPS	AMPS
Compressor #2 (if equipped)	AMPS	AMPS
Compressor #3 (if equipped)	AMPS	AMPS
Compressor #4 (if equipped)	AMPS	AMPS

1. VAV units with heat section - simulate heat call to drive VAV boxes and VFD/IGV to maximum design airflow position.
2. VAV units without heat section - VAV boxes must be set to maximum design airflow position.

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OPERATING MEASUREMENTS - COOLING

Stage	Discharge Pressure	Discharge Temp.	Liquid Line Temp. ¹	Subcooling ²	Suction Pressure	Suction Temp.	Superheat
First	#	°	°	°	#	°	°
Second (if equipped)	#	°	°	°	#	°	°
Third (if equipped)	#	°	°	°	#	°	°
Fourth (if equipped)	#	°	°	°	#	°	°
Reheat 1st Stage	#	°	°	°	#	°	°

1. Liquid temperature should be taken before filter/drier.

2. Subtract 10 psi from discharge pressure for estimated liquid line pressure

Outside air temperature	_____	°F db	_____	°F wb	_____	%RH
Return Air Temperature	_____	°F db	_____	°F wb	_____	%RH
Mixed Air Temperature	_____	°F db	_____	°F wb	_____	%RH
Supply Air Temperature	_____	°F db	_____	°F wb	_____	%RH

REFRIGERANT SAFETIES

Action	Completed	See Notes
Prove Compressor Rotation (3 phase only) by gauge pressure	☐	☐
Prove High Pressure Safety, All Systems	☐	☐
Prove Low Pressure Safety, All Systems	☐	☐

OPERATING MEASUREMENTS - GAS HEATING
 Fuel Type: ☐ Natural Gas ☐ LP Gas

Action	Completed	See Notes
Check for gas leaks	☐	☐
Prove Ventor Motor Operation	☐	☐
Prove Primary Safety Operation	☐	☐
Prove Auxiliary Safety Operation	☐	☐
Prove Rollout Switch Operation	☐	☐
Prove Smoke Detector Operation	☐	☐
Manifold Pressure	Stage 1	IWC ☐
	Stage 2 (If Equipped)	IWC ☐
	Stage 3 (If Equipped)	IWC ☐
Supply gas pressure at full fire	IWC	☐
Check temperature rise ¹	☐ measured at full fire	°F ☐

 1. Input X Eff. (BTU output)
 1.08 X Temp. Rise

Ducted Systems

OPERATIONAL MEASUREMENTS - STAGING CONTROLS

Verify Proper Operation of Heating/Cooling Staging Controls

Create a cooling demand at the Thermostat, BAS System or Smart Equipment™ Verify that cooling/economizer stages are energized.	☐
Create a heating demand at the Thermostat, BAS System or Smart Equipment™ Verify that heating stages are energized.	☐

Verify Proper Operation of the Variable Frequency Drive (If Required)

Verify that motor speed modulates with duct pressure change.	☐
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FINAL - INSPECTION

Verify that all operational control set points have been set to desired value Scroll through all setpoints and change as may be necessary to suit the occupant requirements.	☐
Verify that all option parameters are correct Scroll through all option parameters and ensure that all installed options are enabled in the software and all others are disabled in the software. (Factory software settings should match the installed options)	☐
Verify that all access panels have been closed and secured	☐
Save a backup file from the unit control board onto a USB flash drive.	☐

OBSERVED PRODUCT DEFICIENCIES & CONCERNS:This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.